SEP 18 1925
...ODICAL ROOM
...RAL LIBRARY
...V. OF MICH.

THE GEOGRAPHICAL JOURNAL

Vol. LXVI No. 3 September 1925

Some Excursions in Oman . . . Major-Gen. Sir Percy Cox 193
The Demarcation of the Turco-Persian Boundary in 1913–14
Col. C. H. D. Ryder 227
Time Signals for Surveyors in the Field . . . Arthur R. Hinks 242
Southeak's Journey through the West 246
The De Filippi Expedition to the Himalaya: Review . . T. G. L. 254
Imperial Stocktaking: Review . . . . . E. A. B., B. H. 257
Reviews The Monthly Record Obituary Correspondence
Contents v
Society Notices vi

LONDON
THE ROYAL GEOGRAPHICAL SOCIETY
KENSINGTON GORE S.W. 7
EDWARD STANFORD, LTD. 12 LONG ACRE W.C. 2

Price Two Shillings

HENRY SOTHERAN & CO.,

New and Second-Hand BOOKSELLERS

DEALERS in PRINTS and AUTOGRAPHS,

and Agents for Public Institutions and Libraries at Home and Abroad.

THEIR SCIENCE DEPARTMENT IS UNRIVALLED IN ENGLAND.

BOOKS and LIBRARIES BOUGHT, or VALUED for INSURANCE or PROBATE.

140, STRAND, W.C.2. (Tel. 1515 Central.) 43, PICCADILLY, W.1. (Tel. 7741 Gerrard.)

Telegraphic and Cable Address:—BOOKMEN, LONDON.

EDWARD STANFORD, LTD.,

CARTOGRAPHERS by Appointment to H.M. THE KING.

Ordnance Map Depot.
Admiralty Chart Agents.

Agents for War Office Maps.
Agents for India Government Maps.

MAP PUBLISHERS AND GEOGRAPHICAL BOOKSELLERS.

:: ENGLISH AND FOREIGN MAPS AND ATLASES. ::

MAPS & PLANS Prepared, Lithographed, Printed and Mounted on the Premises.

Sole Address: **12, 13 and 14, LONG ACRE, LONDON, W.C. 2.**

CINEMATOGRAPH AND LANTERN EXPERT

I have travelled the known and unknown world (including two Polar Expeditions) with the **"CINE" CAMERA.** I can thus offer practical experience and advice.

EXPEDITIONS UNDERTAKEN anywhere, or provided with the right photographic and developing equipment.

LANTERN SLIDES made and coloured.

EXHIBITIONS arranged with own plant.

HENRY HOWSE, F.R.G.S., 33 & 35, Pavilion Road, Knightsbridge, London, S.W.

BOVRIL
puts Beef into you!

The Geographical Journal

Vol. LXVI No. 3 September 1925

SOME EXCURSIONS IN OMAN

Major-Gen. Sir Percy Cox, G.C.M.G., G.C.I.E., K.C.S.I.

Read at the Meeting of the Society, 6 April 1925. *Map follows p. 288.*

WHEN recently invited to read a paper describing some short journeys made a good many years ago in the Hinterland of Oman I had great hesitation in consenting, as I doubted whether my travels, which hardly amounted to more than excursions, would be found to provide sufficient material, from a geographical point of view, to justify the reading of a paper before this Society. I rather felt that what was new would not be very interesting, and what would be interesting was not new. However, after going through my notes and photographs taken at the time, I have ventured to respond, and trust you will find that what the result lacks in geographical importance is to some extent made good in human interest.

I beg here to express my obligations to the Secretary of State for India for the facilities kindly afforded me to see and draw upon the reports and photographs which I submitted officially at the time.

The two short journeys with which I am going to deal took me, first, from Abu Dhabi to Baraimi and thence onwards along the fringe of Oman on the desert side to the Jabal Akhdhar or Green Mountains and home to Muscat by the Wadi Samail, a total distance of about 400 miles; secondly, from Ras al Khaima to Baraimi, and thence direct to the coast at Shinas and on by the seashore to Sohar.

The section from Abu Dhabi to Baraimi had been previously traversed in 1901 by the Rev. Samuel Zwemer, a missionary of the Dutch Reformed Church then working at Bahrein, and that from Baraimi to Sohar also by Mr. Zwemer on the same expedition, and by Colonel Miles travelling in the opposite direction in 1875. Both travellers related their experiences in the *Journal* of this Society, and I shall have occasion to allude to points in them later on.

As regards the country further south, Lieut. Wellsted, in 1835, having rested for a few days at Burka on his return from the Jabal Akhdhar, started afresh from the Batina coast intending to make for Baraimi,

then in Wahabi occupation. From thence he hoped, somewhat sanguinely, I think, to be passed on, under Wahabi auspices, to their capital in Nejd. On reaching Ibri, however, he found the town full of Wahabis and somewhat in a state of ferment, and the local Wali on behalf of the Muscat Government being unable either to further his onward plans or to protect him if he remained, he had no alternative but to retrace his steps, shaking the dust of Ibri off his feet in the face of a somewhat hostile demonstration from the inhabitants.

Just half a century later, in 1885, Col. Miles, coming round from Muscat by the Wadi Samail and Nizwa, passed through Ibri to Dhank, but the time at his disposal did not admit of his proceeding further north and he was obliged to bend his steps homewards from that point, making for the coast at Barka *viâ* Rostaq. Save that one of his followers who lagged behind was waylaid and robbed just outside the town, Col. Miles, travelling undisguisedly as British Representative at Muscat, and possessing a competent knowledge of Arabic, fared better at Ibri than his predecessor had done, but even he had reason to complain of the surly attitude of the people of Mazum a few miles further on.

From the foregoing review of previous travel it will be seen that the section between Ras al Khaima and Dhank was the only portion of my route not previously traversed by a European. That being so, I may in general spare you details incidental to all caravan travel in desert or semi-desert tracts, and merely touch upon such points of interest as my notes or photographs recall.

The journeys in question having been undertaken from my head-quarters at Muscat, while I was serving there as Political Agent of the Government of India, I should like to transport you to the Sultan's capital for a few minutes in order to give you some local colour before we embark for the provinces.

The harbour and approaches to Muscat from the sea form an extra-ordinarily attractive picture, and for me possess a charm entirely their own. The first indication a traveller gets of the place as the steamer comes up the coast from the southward is a glimpse of the old Portuguese fort at the south-eastern corner of the harbour, now known as Fort Jalali. Then passing on towards the eastern arm of the harbour, or cove, as it really is, and rounding the island promontory you see on your port bow the barren rocks bearing the time-honoured record of ships which visited the port of old and painted their names on the barren rocks. Then you have before you the front and entrance of the same old fort, Jalali, with its battery of antiquated cannon directed from their embrasures at random across the harbour, while the closely packed town lying at the toe of the horseshoe opens out to view as the ship passes in between the points.

The picture now before us includes the Sultan's custom house and palace on one side with the British Agency at the eastern end of

the foreshore, its foundations forming the sea wall at that point. It will be realized that when, as often happens in winter, a strong breeze from the north drives breakers into the harbour, their continual thud against the walls of the building is somewhat trying, but as in the case of most chronic noises one gets used to it after a bit. At the other or western extremity of the foreshore lies Fort Merani, the other of the two old Portuguese forts built to command the sea approaches. Though the older of the two, it is neither so solid nor so picturesque as Fort Jalali, and the old cannon located on an emplacement halfway down the rock are now relegated to saluting purposes. The fort however contains an interesting stone tablet let into the masonry recording the building of the structure in the eighth year of the reign of Philip I., King of Portugal, by the command of the Viceroy of the Portuguese Indies, and its completion by its founder and first captain, Belchior Calaça, in 1588.

A full translation of the inscription, from which the above summary is taken, is given by Captain Arthur Stiffe, R.I.M., in his "Ancient Trading Centres of the Persian Gulf," in the *Journal* of this Society.

Any one who has the energy to climb to the top of the rugged hills at the back of the town is rewarded with a fine view of the harbour and the town within the walls, and will notice how every foot of available space seems to have been taken advantage of.

Apart from the coming and going of men-of-war and merchant vessels, which were perhaps the main factor in the life of the place in my day, the harbour was a never-failing source of interest in one way or another. In the hot weather it was always visited by small parties of fishermen from the island of Socotra, who camped about in the neighbouring coves and made a living by fishing from their catamarans, and diving for jetsam in the harbour. Civilized fishing-rods were among the articles they periodically recovered from the bottom—carried away, I always supposed, by big fish, when the owners, fishing from the decks of ships in harbour, had fallen asleep or left their rods hitched to a stanchion. These Socotrans used a large rectangular fishing-basket which they anchored to the bottom with heavy stones, and employed for trapping red and grey mullet, apparently the only fish confiding enough to patronize them.

Up to quite recent years the dwindling survivors of a fine old type of clipper sailing ship used to ply from Muscat and other parts of the Persian Gulf to Calcutta and even to China. There were about a dozen of them left when I first went to the Gulf, but one by one they have all now disappeared. Within my own ken, one of the last foundered on the voyage to Calcutta, while another sank in the fairway in Muscat harbour and had to be cleared with dynamite. The Arab captain of one of them claimed once to have made the voyage from Muscat to Calcutta in

seventeen days, with a strong wind behind him. This would give an average of about 7 knots.

Let us now walk through the town past the Sultan's palace and the shops of the Indian traders—Hindu Bunnias who do most of the business in foodstuffs; then out beyond the town walls by the Tuyan gate and into the valley beyond wherein lie the sweet waters of Muscat. Just outside the gate we pass a little establishment of the greatest importance to the housewives of Muscat—the retail oil and fuel shop. In such barren surroundings as exist, firewood is inevitably a very scarce and expensive necessary of life, and is sold almost by the stick, and it is surprising to see how few sticks suffice for the modest daily needs of a Muscat kitchen. A couple of hundred yards further on we come to the small oasis created around the sweet-water wells, which even in times of drought never seem to fail. As one regards the town from the harbour it appears set so close against its background of burnt-up rock that one can hardly believe that it boasts such a verdant spot as this tucked away behind it. On the Muhammadan Eeds or festival days most of the inhabitants disport themselves outside the town, in this and other small oases. From the wells in the wadi bed, over which a small watch tower keeps guard, the populace draw their water by hand and bucket, but in the tiny vegetable gardens clustered round the irrigation is done by bullocks toiling up and down a steep slope and filling a large leather skin at each lap. There are many such wells at Muscat, and the bucket wheel of each develops a special wheeze of its own which the owner cultivates and recognizes, so that when not in his garden he may know by the familiar sound that his employé at work on the well is not slacking. When the wells are in operation the chorus of wheezes is phenomenal, but one almost gets to like it—in the distance.

It will at once strike the visitor to Muscat that the population contains a large negro element. The reason is that in bygone days Oman was probably the most extensive market existing for the slave traffic by dhow from the African coast, and one of the most creditable achievements of Great Britain in those waters has been its persevering suppression. A few escaped slaves are still freed annually by H.M. ships or at British Consulates, but the numbers are gradually decreasing.

According to the International Slave Trade Convention, slaves taking refuge under the flags of the Signatory Powers, whether ashore or afloat, become automatically free; and though nowadays other flags are no longer in evidence, there were at one time a good many slaves in Muscat who had been released by French as well as by British men-of-war in the Indian Ocean. The result was that during the period of somewhat acute rivalry which prevailed between Great Britain and France in the few years preceding the *Entente*, these communities of freed slaves were most staunch supporters of the flag to which they owed their freedom, and the attitude of cordiality or the reverse prevailing at the time between

MUSCAT: FORT JALALI

BENI HABIB VILLAGE, JABAL AKHDHAR

ENTRANCE TO ELPHINSTONE INLET

IDAIYEH

MASAIKIN PLAIN

the British and French representatives at Muscat was speedily reflected in the slave communities, and on special occasions free fights among them were not unheard of. Altogether the ex-slave communities were a merry crowd, and a frequent source of interest. For instance, the British freed had their own band, which on state occasions, such as the King's birthday, would come and discourse sweet music at the British Agency; while, on the occasion of a memorable tour to Muscat and the Persian Gulf by the Viceroy of India, the late Lord Curzon, a number of them appeared on the sea front as a sort of boat carnival, dressed up to represent boats of various patterns, including one displaying a picture of Queen Victoria on its side.

I have explained to you how rock-bound the town of Muscat is. In consequence all caravan traffic with the interior has to be conducted through Matrah, the commercial port of Muscat, lying at the head of a more extensive but less sheltered bay 3 miles to the north.

So much for the capital of Oman. Its picturesque surroundings naturally lend themselves generously to the water-colour artist and the photographer. Unfortunately, the camera takes no account of the temperature, which for some months of the year is almost insupportable. But Muscat had its compensations in other directions, and my wife and I spent nearly five interesting years there.

When the Sultan heard of my lively ambition to make an expedition from Abu Dhabi to Muscat, he entered heartily into the proposal, and said he would be glad to seize the opportunity of coming with me as far as Abu Dhabi, as he had several matters connected with tribal politics which needed discussion with Shaikh Zaid bin Khalifa, at that time the grand old man of the Pirate Coast, on whose friendly offices I depended for safe passage for nearly half the journey. I was of course only too willing, and we proceeded there in company: he and his retainers in his steam yacht the *Nur al Bahr*, and I in H.M.S. *Redbreast*, one of the small gunboats of the East India Squadron.

As we steam up the coast and round the promontory of Oman towards the Trucial Coast I will touch on one or two points of interest which we pass *en route*.

The hinterland between Muscat and Khor Fakkan consists of a fertile maritime plain lying below the foothills of the main range, averaging about 20 miles in width. Along the shores of it lie a goodly number of fishing villages, and a few small townships of considerable local importance, situated as a rule near the mouth of a wadi descending from the watershed above, and so providing water for irrigation. At several of these ports, generally where a wadi coincides with an important route from the interior, are to be found small communities of British Indians: partly Hindu Bunnias, and partly Muhammadans of the Khoja persuasion, descendants of immigrants from Sind and disciples of H.H. the Agha Khan or recent seceders from his faith. These communities it was the

duty of the British representative to look after and occasionally visit. Unfortunately, most of this coast is liable to heavy surf when the wind is off the sea, and landing from boats is then very difficult and often impossible. It was consequently always my habit, on my visits to these ports, if flat calm did not prevail, to wear a bathing suit under my clothes; and I have several times, when my boat was unable to approach the shore, had to wade and swim in with my clothes on my head. On one or two of these visits I have reached the beach in this undignified garb under a ceremonial salute of two or three guns from the local Arab Governor. These old rusted iron guns, generally lying on the ground without carriages, are to be seen in twos and threes in most of the small ports of the Persian Gulf—relics, I suppose, of Portuguese days. After setting a match to the touch-hole, the gunners have to be pretty nimble to get clear of the recoil, and I have known of several accidents resulting from a loader inserting a new charge in his excess of zeal while the remains of the previous one were still smouldering.

Whenever possible I would give a few days' warning of my coming, so that neighbouring Arabs having cases to be settled in their dealings with the Indians might have time to make rendezvous with me.

The most important of the Batina coast ports is Sohar, the residence of the Sultan's provincial Governor, and the headquarters of an administrative Division. It has a distinguished history in the annals of Oman, and it was there that the present Al Bu Sa'id dynasty of sultans originated.

An important seaside industry at many of these ports is the preparation of shark flesh for transport to the interior. It is dried in the sun into a sort of biltong, and is largely imported inland, where it is a staple article of food. I have sampled it once or twice when my men were eating it and found it very tasteless, and exceedingly tough and stringy; at the same time, as the natives seem to like it, it is a very useful and portable form of provender for one's following.

As we near Khor Fakkan the maritime plain comes to an end, and we approach the point where the hills come down to the sea and begin to form the rugged and ironbound promontory of Ruus al Jibal, or "mountain headlands," ending in Ras Musandam, or "Anvil Head."

Near the end of this promontory are two deep bays, one on either side of it. Locally, of course, they have their own Arabic names, but on our charts, and among Englishmen, they are known as the "Malcolm" and the "Elphinstone" inlet respectively. They are very much alike the one to the other, but the "Elphinstone" Inlet, which wanders inland for nearly 10 miles, is of the more interest to us, as it contains the ruin of a British cable station which was located there in the first half of the nineteenth century. The scenery in the inlet reminds one greatly of a Norwegian fjord, and we may explore it in passing. Far inside is to be seen the long-deserted telegraph building. The Indo-European

Telegraph Department to which it belonged found they could not keep their employés alive, much less in health, owing to the intolerable heat of the summer aggravated by the solitary conditions of life, and the station accordingly had to be transferred to the island of Hanjam, where we now have an important cable and wireless station. This part of the promontory is occupied by small hamlets and fishing villages belonging to a strange tribe called the "Shihuh" (some of the Ichthyophagoi of Ptolemy), whose origin has always been a subject of doubt and surmise. Individuals of the tribe whom I tackled on the subject stoutly repudiated, as they naturally would, the suggestion that they were a mixed race, but such evidence as there is, whether of type or dialect, certainly points to an admixture of the Arab with the Persian and Baluch. Be that as it may, they are a very simple and unsophisticated community eking out a precarious livelihood and subsisting on fish, with a little rice, and in the more isolated hamlets, particularly on a shellfish of the genus Strombus, which is found in great numbers in all their coves. As you tour the inlet an occasional boat ventures to put out from some little hamlet on the shore, to offer wood or fish for sale. Their habitations in these places are like tiny crofters' huts formed of loose blocks of stone, and not high enough to stand upright in.

Leaving the inlet and passing on our course south-west along the Trucial Coast, we touch the fringe of the Great Pearl Bank. It is in this deep arm of the Gulf that most of the great pearling industry is carried on, sending to civilization annually pearls to the market value of nearly 3 millions sterling. The pearl fishery is practically the whole life of the inhabitants of the western shores of the Gulf, of whom upwards of 20,000 are employed in it; and one of the most important tasks which we have shouldered, as being inseparable from our position of predominance and control in these waters, has been the resolute preservation for them of this industry; firstly, against piracy, and secondly against its invasion by instruments of modern science, such as diving dresses and steam dredgers. The fishery is carried on in two categories: the deep-sea fishing (speaking relatively) and the inshore fishing; the one worked by moderate-sized sailing vessels on the deeper banks, often many miles from the mainland, and the other in rowing boats, a few miles from the shore. The former carry a fortnight or three weeks' provisions and remain out till it is time to replenish, unless driven in before by stress of weather. For the inshore fishing the boats come out from their home port for the day only and return with their catch at dusk. On the course from Ras Musandam to Abu Dhabi, if passing at the right season, one falls in with both categories.

Their methods and equipment are extremely primitive; the latter consisting merely of a horn nose-clip, leather finger-stalls, a basket, a knife, and a communication cord. The divers help themselves to sink with a heavy stone, which is hauled up as soon as they reach bottom.

We are now passing the Trucial Coast ports, of which Ras al Khaima, Sharja, Dibai, and Abu Dhabi are the chief. We are concerned at the moment with Abu Dhabi only. On arrival there, the Sultan and I landed from the vessels which had respectively conveyed us, the Sultan staying with the Shaikh, while the Arab guest-house was placed at my disposal. The simultaneous descent upon them of the Sultan of Muscat and the British representative was such an unusual event that the equilibrium of the community was considerably disturbed, and anxious as I was to get under way, I realized that there was no business to be done in the way of getting a caravan together until the Sultan had departed and things had simmered down. Meanwhile His Highness promised to explain to the Shaikh what I had come for, and arrange with him at what point on my route the Khafirs which the Shaikh at Abu Dhabi would send with me to the confines of his sphere of influence, would hand me over to the Sultan's Khafirs coming from the Muscat direction on His Highness's behalf. The latter only remained one night; the following morning the Shaikh of Abu Dhabi gave H.H. and myself a display of some of his blood stock at a sort of gymkhana on the sands behind the town, at which I managed to get one or two pictures.

In the evening the Sultan departed, and I then began to get busy with my plans.

The relative position of the Principalities of the Trucial Coast, *inter se*, depends almost entirely on the personalities of the ruling Shaikhs for the time being. Unfortunately, owing to the chronic prevalence both of family and tribal feuds, they have for the last few generations been a short-lived class: nevertheless, at the period of my journey the Shaikh of Abu Dhabi, then over eighty years of age, had successfully retained his seat for more than half a century, and consequently enjoyed a very commanding position among his fellows. His practical influence extended not only to Baraimi, where he owned large date gardens, but also far beyond. I had met him before and knew that I might depend upon his friendliness in general, but it seemed inevitable that in the first instance, in the natural wish to save himself any inconvenient responsibility in regard to me, he should endeavour to deter me from my journey on various grounds, *e.g.* excessive heat, dearth of camels, absence of water and grazing, etc., and it required two or three long interviews and much persuasion to induce him to further my plans. However, at last he not only consented but insisted that I should travel as his guest as far as Ibri, after which I was to become the responsibility of the Ruler of Muscat. Before we parted for the night he had promised to do his utmost to obtain camels and arrange for me to start the following day.

The next morning, while the camels were being collected, I walked about the town with the old Shaikh and his sons, and was conducted through the bazaar, which seemed a very good one for such a benighted spot, containing almost everything needful in a small way from a note-

book to a rat-trap. The daily life of the Shaikh provided a very interesting example of the patriarchal system. It will be understood that a man in his position is frequently obliged by the exigencies of tribal politics to make sudden matrimonial alliances which must sometimes place considerable strain on the strict interpretation of the Koran; and here in Abu Dhabi this venerable Benedict had several different establishments dotted about the town between which he divided his attentions. It was his habit, in the hot season at all events, to conduct the administrative business of his principality and dispense justice sitting out in the open in the early mornings outside the particular *ménage* forming his domicile for the time being.

I found the coffee habit on these occasions very trying. The coffee-pot and sweetmeat-tray were produced on every possible excuse, and small cups of the strongest black coffee spiced with a few cardamum seeds administered continually. It was just the same when travelling: my caravan never seemed able to go a couple of hours together without halting for a few minutes to make coffee, yet they would readily go without solid food from morning till night, when it suited them.

About 2 p.m. my camels began to arrive, but it was 5 p.m. before we got away. Shaikh Zaid accompanied me for a short distance and sent his son Sagar with me as far as Maqta, the ford across the tidal creek 10 miles from the town. Sagar was a handsome and intelligent young man, thirsting for knowledge of the great world, and, apart from some small grievances which his father had instructed him to ventilate, the chief topics of our conversation were the development of wireless and the idea, recently mooted by the late Rev. J. H. Bacon, the aeronaut, of crossing the Great Arabian Desert by balloon. I had seen mention of it a few days before. Sagar left me about 8.30 p.m. on his own side of the creek, and I just managed to get across with the water up to my girths, guided by the old caretaker of the tower which stands in mid-stream to guard the ford.

I see that Dr. Zwemer, referring to this ford, says that "ordinary camels with their riders have a close escape from drowning every time they cross" (I suppose from the current), but I was blissfully ignorant of the danger when I crossed. I lay down as I was on the further side of the creek and slept till 1.30 a.m., finding it very cold owing to the heavy dew, though the season was about the hottest in the year. Then we started over the sand-dunes, passing the landmark called by Zwemer "Suq Iblis," or "The Devil's Market," about 7 a.m. My companions did not know it by that name: they called it "Narsáila." The question of topographical names among Arabs is always a difficult one; it often happens that different communities know the same features by different names. As the caravan's track passed 200 or 300 yards from the sandstone outcrop, I turned aside to examine it closer and see if there were any birds or other live things on it, and found lying at the base of it, at a spot where I

suppose he had found a little shade, the fresh skeleton of a negro, with some tufts of woolly hair still adhering to the skull. I inquired from my companions if there was any particular story attached to these poor bones, and they informed me that it was the skeleton of a young slave who had recently fled from Abu Dhabi and must have died of thirst. I thought to myself, " A slave in Abu Dhabi is verily between the Devil and the deep sea." The Shaikh acting as my Khafir or pilot and responsible to the Shaikh of Abu Dhabi for my safe passage was one Muhammad Bin Hilal adh-Dhahiri, the Dhawahir being a tribe whose habitat is in and around the Baraimi Oasis. I seemed to know his face, and on comparing notes I found I had met him some years before at Sohar, when I was there on a visit with the object of recovering some ingots of silver which had been pirated from a wrecked steamer and had been traced to Sohar.

To-day for the first time I heard " the music of the sands " as the caravan toiled up and down the sand-dunes : it was like the booming of a great organ in the distance, and, to one hearing it for the first time, an extraordinary phenomenon. At nightfall we bivouacked in the sand-dunes, and the following day reached some wells known as Huwail, close to which was a single date-mat shelter occupied by an aged Badoo of the Bani Yas tribe, who made his livelihood by helping to water camels. He possessed a fine she-camel and foal, and on our arrival apparently announced his intention of killing the foal, as he said, " in honour of Shaikh Zaid's friend." I was having my tub when I got the message, and shouted out immediately that I did not want the meat and that the foal was not to be killed, but it was too late. The old man had stabbed it in the chest and cut its throat before I could stop him, and the wretched mother moaned restlessly for her offspring for the rest of the day. My followers were no doubt inwardly delighted, as they got a sumptuous meal while I had to make generous amends to the old man.

During these two days I saw frequent tracks of the Reem Gazelle (*Gazella Marica*), and also a small herd of Muscat Gazelle (*Muscatensis*) which passed a few hundred yards ahead of us. On the evening of May 4 we reached the outskirts of the Baraimi Oasis, the last two hours of the march being through very heavy sand-dunes. All the afternoon Jabal Hafit had been in evidence on our right front—apparently a perfectly barren mountain. On descending from the sand-dunes and just before reaching my pilot's summer camp, we crossed a Batha or scour bed about 300 yards broad, which my companions simply called " the Batha," and stated that it had its origin in the Bani Kaab hills and reached the coast just west of Abu Dhabi. It is probably a confluent of the Wadi Telaif referred to by Col. Miles in that connection. Bin Hilal stated that it periodically became a running stream.

We were making for the latter's summer camp, and as we approached his family tents it was a very pretty sight to see the affectionate delight with which the two children of his younger brother ran out to greet him

and their father. Until they saw our party approaching in the distance they had had no warning of our coming, and now, racing over the sands towards us, they fell rapturously on their father's neck and hugged him—two pretty and well-bred little Arab children. On arrival I was at once deposited in the family guest tent, of very coarse black-and-white blanketing, and there our party sat awaiting coffee while one person after another dropped in to welcome us. It was interesting here to note the various forms of greeting in vogue. The slaves and menials kissed our hands; both youths and adults kissed Bin Hilal on the lips, just touching them; others rubbed noses, a practice I had never seen on the Muscat side of Oman—probably imported, like the slaves, from Africa.

The camels which had brought us had only contracted to come as far as Baraimi, and another lot was supposed to have been ordered to meet us there, but Bin Hilal gave me no hope of getting any before the 7th, this being the 4th.

My journey from Abu Dhabi had taken fully forty hours of actual travelling, whereas Dr. Zwemer records that he did it in thirty-three, or that thirty-three is the ordinary time for a caravan. Although the position of Baraimi, afterwards determined accurately by Lieut. Scott and myself, makes it only 95 statute miles in a direct line from Abu Dhabi, I could not make it less than 100 miles' actual marching by the course which we had followed, calculating the rate of the caravan, which I frequently timed, at 2½ miles per hour. Travelling very light, it would no doubt have been possible to ride through in thirty-three hours, but I cannot imagine it being done in that time with a string of laden camels over this heavy sand. I found it exceedingly hot at Baraimi. The temperature at breakfast was 110° F., and I noted that all the natives in and round the camp were wearing curious thick socks of many colours, made locally, to protect their feet from the intense heat of the sand. Old men of the community sat about knitting these socks at odd moments, to the manner born, and they seemed to wear well in the loose sand.

This is all I have to tell you regarding the section from Abu Dhabi to Baraimi, and leaving me there waiting for a fresh lot of camels for the onward journey through the Dhahira Province, to the Jabal Akhdhar and Muscat, I will ask you to imagine yourselves back at the coast; this time not at Abu Dhabi but at Ras al Khaima, from which point I made a second journey to Baraimi in 1905. The circumstances in which it befell me to visit Baraimi again after such a comparatively short interval were these. At the time in question my lamented comrade, Mr. J. G Lorimer of the Indian Civil Service, was engaged at the headquarters of the Government of India in compiling, for official purposes, a book of reference dealing with the external spheres of interest of that Government, and it was the duty of local officers concerned to render him all possible co-operation. I received a letter from him one morning explaining

that the officer of the Survey of India engaged at Simla in constructing an up-to-date map of the region to accompany his compilation, Lieut. Fraser Hunter, was very anxious that the latitude and longitude of Baraimi should be accurately determined, as the precise position of many other points hinged on it. Mr. Lorimer asked if I could possibly arrange to get this done. Being in a position at the moment to absent myself from headquarters for two or three weeks, I thought the simplest course would be for me to undertake the task myself, with the co-operation of the Commander of R.F.M.S. *Lawrence*, the Indian Marine Despatch Vessel on duty with the Resident in the Persian Gulf.

Having once traversed the wilderness between Abu Dhabi and Baraimi, I decided to try a new route and start inland from Ras al Khaima; and it was accordingly arranged that the *Lawrence* should convey me there, and that one of her navigating officers should be placed at my disposal, together with one of the ship's chronometers and a sextant for taking the necessary observations. Lieut. C. A. Scott was the officer deputed, and in due course he and I were landed at Ras al Khaima with our frugal baggage and precious instruments. As soon as we were well away the ship was to steam round to Sohar, on the Batina coast, and await our arrival there.

In order to give the chronometer the best possible chances, we had devised a sling arrangement consisting of two stout rubber rings about 1 foot in diameter, connected like two links of a chain; the chronometer was suspended from the lower ring, while a bamboo pole was passed through the upper ring and the ends of it carried on the shoulders of a specially selected level pair of Arab coolies. Lieut. Scott or I marched behind these coolies the whole way, one of us always being in vigilant attendance on the instrument, to ensure that it was not jolted or bumped on the ground when the caravan halted. It was a very tedious task, as you may imagine, tramping, often through heavy sand, on the heels of the coolies for 100 miles or more; but the trouble expended was fully justified by the result, as we found on rejoining the *Lawrence* that the instrument had maintained an excellent rate, and Lieut. Scott had taken several very satisfactory sets of sights, including of course the position of Baraimi. Nowadays the possession of a small portable wireless set would have made such a laborious process unnecessary, but at that time wireless was not developed to that extent. The position of Baraimi, as subsequently determined by Lieut. Scott, makes the distance from Ras al Khaima, as the crow flies, approximately 110 statute miles, that is, 10 miles longer than from Abu Dhabi. According, however, to the readings of the survey wheel, or "perambulator," which Lieut. Scott and I took with us, the distance actually covered over the ground was 125 miles, and this receives corroboration from the time test of 2½ miles per hour, as it took our string of camels forty-nine marching hours, as compared with forty hours for the 100 miles from Abu Dhabi.

FORT AT NEJWAH

TANUF

JABAL KHIDR: A PEAK OF THE JABAL AKHDHAR

SHARAIJA: LOOKING DOWN THE WADI MI'AIDIN TOWARDS BIRKAT AL MOZ

MUTI, AT THE BASE OF JABAL AKHDHAR

I will briefly describe Ras al Khaima before we start inland.

The principality begins where Muscat territory ends, on the coast below Ras ash Sha'am, while its southern boundary runs inland with that of the adjoining principality of Jazirat al Hamra, and then crosses the peninsula to Diba, which is an appanage of Sharja.

I have referred earlier this evening to the Jowasmi pirates, who were such a menace to the peace of the Gulf during the early part of the nineteenth century, and incidentally under strong Wahabi influence. Ras al Khaima was their stronghold, and it was against that port that a British expedition under Sir W. Grant Keir was despatched in the winter of 1819–20. The Sultan of Muscat, welcoming any step likely to check the progress of the hated Wahabis, co-operated heartily with us both by land and sea, and the result of the expedition was the speedy submission, not only of Ras al Khaima but of all the other Pirate Coast chiefs. It was this successful operation that brought about the Maritime Truce to which I have previously referred. The principalities of Ras al Khaima and Sharja are still under the rule of members of the Jowasmi clan, but the numbers of this stock are now so diminished that the Jowasmis can no longer be regarded as a tribe.

The town of Ras al Khaima is built on a long narrow spit of sand running parallel to the coast and enclosing between it and the mainland a wide lagoon which provides a very convenient and sheltered anchorage. It was this quality, no doubt, which made it such a popular resort for pirate craft in days gone by.

We experienced no difficulty in obtaining camels at Ras al Khaima, and only spent one night there, leaving our quarters in the Shaikh's fort the next forenoon in the presence of an interested crowd.

The terrain encountered when caravaning from Ras al Khaima to Baraimi differs considerably from that between Abu Dhabi and Baraimi. On that side it was practically an unmitigated waste of sand the whole way. Here you have almost level tracts of sandy or stony plain alternating with re-entrants of sand-dunes, the former greatly preponderating and for the most part plentifully clad with jungle trees and vegetation, and dotted with wells at comparatively frequent intervals.

Moreover, according to my inquiries, it would appear possible, by making *détours* of no great magnitude, to avoid most of the sand-dunes altogether, except at those infrequent intervals when a heavy rainfall has made the surface of the plains too greasy to be safe for camel traffic.

But with no previous experience or information regarding the route, and my main object on this occasion being to nurse the chronometer and get the position of Baraimi fixed as quickly as possible, it was not worth my while to take chances by making tentative *détours*, so I never went far afield from the ordinary caravan route.

Though sometimes possessing no particular landmark or apparent limit, all these separate tracts to which I have referred have their individual

names and accepted boundaries in the minds of the local inhabitants, names of places being chiefly taken from the most important wells in the area.

The first tract you enter on leaving Ras al Khaima is the cultivated plain of Sir, the commencement of which is seen across the lagoon. It runs for about 7 miles south of Ras al Khaima, and contains ten villages boasting some 2500 inhabitants and gardens containing about 10,000 date trees. Irrigation is from wells.

This Sir district, of which Falaiya is the most southerly village, is brought to an end by the convergence of the sand-dunes towards the hills. The plain of Jiri is then entered. From this point to Baraimi no settled habitations or communities are encountered except in the Dhaid oasis. The rest, as I have already stated, consists of alternations of jungle-clad plain and undulating sand-dunes—the latter, however, only representing about 20 per cent. of the whole distance.

Dhaid is an appanage of Sharja, the chief Jowasmi principality on the Trucial Coast, and the Shaikh of Sharja is represented by a Wali who resides in a walled enclosure or fort of the usual type over which flies the " White-pierced-red " flag of the Trucial chiefs. The principal functions of the Wali are to enforce order generally, to maintain peace between the different tribal communities in the colony, and to control the distribution of water from the fine Falaj or underground aqueduct which waters the oasis. This Falaj takes off from the Wadi Haqala in the foothills of the spinal mountain chain 18 miles away, and passes through the precincts of the fort as it enters the settlement. The village consists of about 150 families practically all dwelling in date-mat huts, and composed of contingents from three tribes, the Tanaij, the Naim, and the Bani Qitab. The area under date cultivation is about 3 miles in circumference. The Jowasmi Shaikhs and their families used formerly to spend some of the summer months in Dhaid, but nowadays it is said to be so continually swept by hot winds that it has ceased to be used as a summer resort.

Except the tract known as Qalla-Mahafidh, which is an elevated stony plain commencing (from the north) about 20 feet above the general level, and gradually descending again in its depth of 3 miles down to the general level, the country between Dhaid and Baraimi differs little from that north of Dhaid, and only calls for passing comment, but the last lap as it were, *i.e.* from Misakin into Baraimi, is perhaps worth a brief description. This Misakin plain lies in a depression between sandhills, plentifully studded with " samr " acacias, tussocks of " arta " grass, and other desert vegetation. From this point Jabal Hafit, the isolated mountain beyond Baraimi, comes into view for the first time some 20 miles away ; also two noticeable sugar-loaf hills thrown off from the spinal range, named respectively Hur al Madal to the south-east, and Jabal Mahadha further away to the east. After traversing the Misakin

valley for 4 miles you rise on to the sand-dunes of Batin al Oyan, a succession of mild undulations 4 miles deep. At 8 miles the gentle character of the dunes develops into a most formidable belt of steep sand-hills and valleys which form a perfect maze. Tracks here are obliterated as soon as made, and caravans must keep close touch as it is very easy to lose direction. After 7 miles of meandering through this tedious wilderness a commanding point is reached from which one looks down on the commencement of the Baraimi oasis 2 miles away, partly hidden by the jungle of acacias. We entered Baraimi on this occasion from the north-west, through the recently formed Bani Yas colony called Mas'udi, started by the eldest son of the Shaikh of Abu Dhabi, and made our camp at the village of Jimi, that being the settlement nearest the centre of the oasis and convenient as a point for fixing its position. When one speaks of "Baraimi," one means not the village of that name but the whole oasis, composed of ten separate villages situated roughly in a circle about 6 miles in diameter. Baraimi village, being the original settlement, has given its name to the whole. It is the headquarters of the Naim tribe, the original owners of the oasis, and possesses the usual square fort of sun-dried brick with a tower at each angle. This fort cannot compare in strength with those in other important centres of Oman proper; but still, such as it is, it is considered strategically important and offers a serious obstacle to a tribal invader approaching Oman from the west. At the time of my visits the population of the oasis was estimated at about 5000. The habitations, which are for the most part dotted about in clusters among the gardens, are built of mud and date screens combined. The water supply is from numerous fuluj or underground aqueducts coming in from the hills to the east, and one or two also from Jabal Hafit. Light though it is the soil is evidently most prolific, and it was calculated that the oasis supported not less than 60,000 date palms besides all the fruits and vegetables to be found in that region, *e.g.* grapes, melons, limes, figs, pomegranates, a few mangoes, and in the way of crops, wheat, barley, and jowari and quantities of lucerne. Trade is partly with Sohar, on the coast to the eastward, but mainly nowadays with Sharja and Dibai, which latter is now a port of call for the British India Company's steamers.

Baraimi boasts no bazaar properly so called; local trade is done almost entirely by barter at an open-air market which is carried on in the Khidáma quarter of Baraimi village. Here the Shaikhs of the Naim, though not now the most powerful tribe in the oasis, still enjoy a special position by virtue of their past history; but the real power in the neighbourhood is the Shaikh of Abu Dhabi, whose material possessions and consequent influence in the oasis are yearly increasing.

As I have mentioned, on the occasion of this my second journey to Baraimi we left for the coast, to rejoin the ship at Sohar with our precious chronometer directly we had fixed the position of the oasis to our satis-

faction. The route to Sohar has been fully described by both Col. Miles and Dr. Zwemer, and in any case time does not admit of my touching on it now; but I will ask you to accompany me onwards through the Dhahira province in continuation of my earlier journey from Abu Dhabi. You had left me waiting at Baraimi for a new string of camels.

We got away in due course on May 7, steering due east *viâ* Muthariz and the Shaikh of Abu Dhabi's new settlement at Jahali, and thence on to the camp at the village of Ain (3½ miles), which lies at the north end of a spur of Jabal Hafit. Jahali had only been in existence for about six years; it possessed a nice new fort and a walled date and fruit orchard, at that time in its infancy, but very promising. It extends to the foothills of Jabal Hafit. Ain is also one of Shaikh Zaid's villages, and he keeps a Jemadar or caretaker there. Across the plain to the north are to be seen the Naim villages of Jimi, Qatara, Baraimi, and Su'ara. On arrival at Ain I was as usual deposited in the guest tent, and found it extraordinarily hot. People crowded in till I felt almost suffocated. While we were sitting there, waiting for the inevitable coffee, one among some Awamir Badawi, who were sitting amongst the company talking to me or about me, pulled off his chefiyeh, or headcloth, and out of a loosely tied knot produced a live scorpion, which he and his companions proceeded to toss to one another and allowed to crawl about all over them. I thought it had probably had a piece of thread tied round the base of its sting, as I had often seen done in India, but they declared not, and certainly none was detectable. Then another Amiri, at the request of the audience, mumbled a long poem, the recital of which was said to prevent any harm ensuing from the sting of the scorpion! I was a good deal worried here by the behaviour of my followers. I had brought plenty of food of my own and had no intention of sponging on any one, and the hire I paid for the camels was specifically calculated and expected to include food for the camels and men, but these camel-men thrust themselves upon the hospitality of any habitations they passed, delaying the caravan to eat hot meals and expecting me to make the necessary return to the Shaikh. There was no end to it, but it seemed the only way to get along. Next day we got off at 6.30 a.m. and trekked for 2¾ hours, about 8 miles, in a direction parallel to Jabal Hafit, bivouacking among the tents of some of Naeim and Awamir Badawi. The former go to the gardens at Hafit during the date season, but live in tents during the rest of the year.

Before quitting Jabal Hafit I should like to try to clear up a misconception involved in Dr. Zwemer's reference to it. In his paper of January 1902 he alludes to Jabal Hafit as "the first spur of the Okdat Range," and goes on to speak (from hearsay, of course, as he did not pass that way) of the "Okdat Range" as if there were one long range stretching as far as Ibri, 95 miles away. The fact is that Jabal Hafit is a solitary hogback hill about 2000 feet high at its summit and

only about 20 miles in length, extending approximately from Ain to Qabil. Its highest point, or rather points, as there are two twin summits, are latitudinally level with the cluster of villages comprising Hafit and consisting of Hafit proper, Gharbi, and Bu Gharah. The use of the expressions " Jebel Okdat " or " Jebl Akabat " is unintelligible to me. I found the word " Okdat " to be one of several synonyms in common use for " sandhills " in those parts ; while " Aqabat " is a word used throughout Oman for a mountain pass, or defile between two ranges.

I think the explanation of Zwemer's misunderstanding is that south-west of Hafit, but quite separate, and not in prolongation of it, there is a line of sandhills (Okdah) which on a clear day might have been pointed out to Dr. Zwemer from the Baraimi road and appeared to him from there as if they were in prolongation of Jabal Hafit.

While here a messenger reached me from my *locum tenens* at Muscat, *viâ* Sohar, informing me that all was well, but announcing that H.M. first-class cruiser *Amphitrite* was expected (on her way out to China), and urging my early return to meet her. This was not very welcome news in the circumstances, nor did I see how I was going to get back in time without changing all my plans. However I replied that I would do my best, and having dismissed the messenger we started off again, making almost due south to Hafit village, which we reached after one hour's trot. We then struck across to the left through bush country to Qabil, where we spent the night, going on to Bizaili next morning. On the way we were fired on from a Badawi encampment, the occupants taking us for a raiding party, but no harm was done. The country we were now passing through reminded me greatly of the Haud of Somali-land, but without the charm of always being in sight of game, and it continued almost till we reached Dhank, three and a half hours' journey from Bizaili. At Dhank we camped outside the town in the open. The usual simoom blew all the afternoon, and the heat was excessive. About 4 o'clock, however, I went to the top of the hill behind the town and scanned the surrounding country towards Ibri and Jabal Hafit. The latter was just visible and nearer due north than I had expected. Dhank possesses some fine date gardens and a running stream. There is no proper bazaar, but as at Baraimi there is a public place where goods are put up for auction or exposed for sale. There was no apparent reason why we should not have camped in the date gardens, but I had the greatest difficulty all along in getting my companions to sleep in the vicinity of the towns ; they always wanted to get away into the open, and I came to realise that they had reason on their side, bred of experience.

My next halt was Mazum, a small settlement of Baluchis allied and inter-married with the Bani Qitab. It consists of about three hundred houses. It was at this village that Miles experienced some incivility, but I had better luck. *En route* however I had a little misadventure. My pilot had previously been expressing his views as to the pace of our

respective camels, and I had agreed that as soon as we came to a stretch of good going, I would match my mount against his. I may mention that I had a very fine and well-bred riding-camel lent me by the Shaikh of Abu Dhabi. The morning after leaving Dhank we came on a suitable bit of going, and accordingly we decided to have our match and started our camels off at full gallop. My camel was fresh, and in trying to pull her up the headstring came away in my hand, and she went away with me into the blue. Sitting as I was behind the hump, according to the approved method of riding in Oman, I could do nothing to stop her, and I was fully occupied in keeping my seat and holding on to my sketching case, compass, etc., and trying to ward off mimosa thorns. The direction she was taking was at right angles to our line of route, and if in my wild career I had happened upon a strange Badawi encampment it might have gone hard with me. I could only just reach the camel's cheek or neck with the end of my riding-cane, and the best I could do was to keep her more or less on a wide circular course by poking at her neck and endeavouring to guide her gradually back towards our starting-point. At last in the course of half an hour I had gradually got her head in the right direction, and my pilot Hamud and another were able to cut in in front of me and head her off. I was somewhat exhausted, my clothes torn, and face and hands badly scratched with thorns, but I was otherwise none the worse. I did not offer to race any more, however!

The method of riding in Oman on a mere skin on the lightest of trees behind the hump is quite different to our method in India, and elsewhere, and though certainly less hard on the camel, needs more efficiency in the rider, and you will realize my plight when the headstring came away.

Once again on the march to Ibri we were fired on from a distant encampment, and bullets whizzed across our bows, but I was now used to this little amenity, which appeared to be the ordinary practice of a Badawi community—based on the assumption that any strange mounted party seen approaching must be enemies on the raid. Apparently the etiquette is to stop and return the fire if you really are an enemy, otherwise ride on and take no notice.

As we neared the town, which had evidently received warning of our coming, a number of horsemen galloped out and gave us a demonstrative welcome, continuing to perform weird evolutions in front of us until we reached the broad shingly wadi just outside the town, where some two hundred men were drawn up in line and fired a sort of *feu de joie*—and not at all badly. We were then escorted into the town by a very friendly if very dirty crowd. The whole populace seemed to have turned out, and women and children lined the path. Burkas (yashmaks) were not much in evidence, and the ladies seemed comely as a whole, but the greasy dirtiness of their apparel was indescribable. Every one, man, woman and child, insisted on shaking hands, in spite of the heat, and would take no refusal.

As I proposed to remain here a day or two, I insisted on camping in a date garden instead of out in the open in the sun, as my companions would have preferred. In the course of time a suitable place was chosen. The inhabitants were very friendly and good tempered—in fact, too much so, for they crowded round my tent all day and allowed me no privacy whatever. Some of them never left me even for food or prayers, and when I suggested that their dinner would be getting cold, they received the hint with an amused smile, but pleaded to be allowed to remain as they had never seen anything like me before. (And the present generation probably had not.) Wherever I went I was accompanied by a small crowd. In the afternoon, when it got cool enough, I walked up to the top of the hill overlooking Ibri from the south-west and took a number of angles to various points. At the top of this hill one gets a good view over the plain embracing the villages of Ghabbi, Araqi, Bait al 'Ainain, Dariz, and the Jabal Misht and the Jabal al Kor, pronounced "Keör." At dusk the ladies of the place were again present in force, and sat round and watched me attentively while I had my dinner. As soon as I had finished the local Shaikh came in, accompanied by four or five other men who were to act as night guards on my camp. Before turning in we discussed Oman affairs and the general insecurity of life which prevailed. Here, in a large town like Ibri, the townspeople are fairly immune from the operation of blood feuds so long as they remain within the town, and they do not allow parties of outsiders to sleep inside the walls. They are afraid of visitors and visitors of them. In fact, in many places where tribal feuds exist men never sleep in their own houses, but always somewhere outside. The reason for this is that if a man is known to sleep at home his enemies know where to find him, and it is a common ruse for treacherous enemies to come to a house at night and call up the occupant, who jumps up without thinking, and the intruders are thus sure of their man. On the other hand, sleeping outside one man cannot be distinguished from another, and thus all are collectively safer.

Ibri is the most important settlement in the Dhahira district, and boasts a tremendous expanse of date groves, a good bazaar, and a fine mosque. It used to have the reputation in Miles' time of being a thieves' market, but seems to have since turned over a new leaf. I was told, however, that in spite of their time-honoured Wahabi associations a good deal of date wine was manufactured here at Ibri; while indigo is extensively grown for home use, half the community having their fingers and faces stained with it. As before explained, from here onwards I was to be the responsibility of the Sultan of Muscat, and it had been arranged that his representative, Shaikh Rashid Bin Uzaiz, should meet me at Ibri, while my camels for the onward journey were to be supplied by the Daru tribe from Tana'am. Shaikh Rashid joined me in due course, and as soon as we had secured our new camels, on May 15 I resumed

my journey. Our first stage was Salaif, a picturesque village having a situation very much like that of Ibri, in a narrow gorge-like wadi with a tower perched above the village on a precipitous overhanging rock. As usual we slept outside away from the habitations, but next morning, the 16th, after taking early tea I had my paraphernalia shifted to a shady date grove, and then went up to the top of the hill with two local guides to take some bearings with my compass. On the crest of this hill there were the remains of some stone fortifications and embrasures, said to have been erected by the Wahabis when they were here early in the nineteenth century. They apparently captured Ibri, but were unable to reduce Salaif. My informants spoke of Al Mutairi as the Wahabi general, and declared that there were persons still alive who remembered the episode.

From Salaif we marched to Kubara, following the Wadi Salaif for 10 miles and then turning south. Kubara is under the lee of Jabal al Kor and about 10 miles distant from it. We found the inhabitants of this village in a very bad way owing to drought. They had had no rain for three years, and their water was failing and date trees not bearing fruit. Poor people! we found them very civil and friendly, and for the first time during our trip we were spontaneously offered chickens and eggs for sale. It was pitiful to see the effects of the last three years' widespread drought: Fuluj failing, date trees drooping, and much land gone out of cultivation. In the morning, while the tents were being struck, I beat a retreat to the nearest date garden for shade, and there I was soon surrounded by a party of housewives from the village. One middle-aged dame did most of the talking, and asked me many questions about my country and discussed the burning question of the drought. They were a very nice, polite lot, and for a wonder did not ask me for medicines or regale me with their ailments. After about half an hour's edifying conversation one of my men came to say that the caravan was ready, so with a "God speed you" from the ladies I went my way.

Both at Baraimi and onward through Dhahira I noticed that the natives, when addressing me or referring to me in conversation, either when not aware of my identity or not sufficiently sure of themselves to address me as "Consul" (or "Balyooz," which is the term used for Consul in Oman and the Gulf ports), always applied to me the word "Nasarani" = Christian: for instance, "Good morning, O Christian," or "Hie! Christian, there is no road that way!" The term did not appear to be said or meant disdainfully, as the speakers were quite friendly, and I took it to be merely a relic of Wahabi fanaticism which was of course predominant in this district in the last century.

From Ibri onwards, or rather from Dhank onwards, the route which I followed differed very little from that of Col. Miles, so I do not propose to deal with it in great detail. There are one or two points, however, wherein the field-book and compass sketch which I made of my route

give the lie of certain features somewhat differently to that given by Col. Miles in the map accompanying his paper in the Society's *Journal* in August and October 1910. Unfortunately, his paper had not appeared at the time of my journey, or the submission of my report, and it was only when it appeared afterwards that I noticed the differences. I can only say that I made a careful field-book and compass sketch and recorded full notes, and the sketch was plotted out immediately on my return, and these are still available, so that, other circumstances being equal, I think my version is likely to be the more accurate. I refer particularly to the lie of Jabal al Kor with reference to Jabal Ahkdhar and Jabal Hamra. The march from Kubara to Saifam proved a long trek of about 26 miles. At 6½ miles we were abreast of the Hadda peak, and reached the pass in 7 miles more. The Hadda peak is not a solitary mountain as it appears when viewed end on from Kubara, but is the northern extremity of a long range forming part of the Jabal Hamra. There is a gradual rise up to the najd at the north end of the mountain, height about 200 feet, and then a steep drop of about 250 feet, during the next 1½ miles into the basin or heart (Jauf) of Oman Proper down below. The route up to the najd was quite good going, and camels could trot nearly all the way. As it nears the apex of the triangle culminating in the najd the path passes quite close to Jabal al Kor, and from here one sees an enormous cleft in the side of Jabal al Kor just opposite the Hadda peak forming the source of the Wadi Ain. In the basin which we have now reached two villages are to be seen, Dan and Nadan. The terrain is hard plain covered with sharp broken talus shingle and dotted with the usual mimosa trees.

On this part of the march one of the escort riding in front did a smart bit of business: he dropped out of the line ahead of us, shot at and killed a hare with his rifle, retrieved it, and mounted again without losing more than a dozen places in the marching line.

The descent into the Jauf of Oman was down a torrent bed, and took us half an hour. On reaching the bottom the path turned right round to the left, that is, to the north-east, along the south side of Jabal al Kor. It was 8 o'clock before we got to Saifam, which lies in a wadi bed of the same name right under the peak at the highest point of Jabal al Kor and not far from the southern mouth of the Najd al Barak, or "Pass of the Lightning," which can be discerned if one moves a little out into the plain. This was the alternative route taken by Miles.

On our arrival at Saifam Shaikh Rashid learnt that the Shaikh Nasir bin Hamad, the 'Utubi Shaikh of Bahla, had come down to Jabrin to meet us, and was awaiting my arrival there, so Shaikh Rashid thought we ought to push on first thing in the morning. We accordingly started off at 6.30, and reached Jabrin, 7½ miles away, at 8 o'clock, the caravan coming in at leisure.

Jabrin is State property, and is now merely the summer quarters of

Shaikh Nasir and a few other Bahla people. The fort looks imposing from the outside. On arrival we were met by a relative of the Shaikh and taken through the village to an open space outside under a fine acacia tree, where they had some camel and horse races for our edification. I noticed that the population here seemed to be mostly negroes. As I was only staying until the afternoon, it was not worth while pitching a camp, and they had a room carpeted in an outhouse in one of the date gardens for us to rest in. People dropped in and out all day. About 2 o'clock I started off with one of my escort and a petty Bani Riyam Shaikh from Tanuf to see Bahla. It was about a 4-mile ride, partly through a thickly wooded glen. It is a most imposing place with a very fine old castle, of which Miles gives a description and a photograph in his paper. I only rode through the town and went over the fort to enjoy the view from the top, and then returned to Jabrin to pick up my caravan. From Jabrin I marched to Nizwa, with a halt halfway at Radda. Radda and Farq to the north are both in the Wadi Nizwa, while facing southwards you are looking towards Manah and Adam, the former being visible in the distance. The whole plain in which Bahla, Jabrin, Kubara, and Nizwa lie is like a large crater studded with low volcanic hills, bounded on the north by the Jabal al Kor, on the east by the Jabal Akhdhar, and on the west to south by the Jabal Hamra, the habitat of the Daru tribe. This latter small range looks geologically of a completely different character to the surrounding systems, and appeared of a bright terra cotta colour.

At Nizwa we had the usual preliminary reception. The Wali was one of the Muscat Royal Family named Saiyid Saif bin Hamad. He it was who got the Nizwa back into the possession of the family by murdering Hilal bin Zahir (for whom see Col. Miles' paper). He received us at the fort gate, and after giving us coffee took me to a date garden where a comfortable shed had been prepared for me. The caravan came in in due course, and after the hard travelling of the last few days I was glad to get into comfortable quarters.

To-day I bade good-bye to some of the men who formed my escort from Ibri. During the journey I had talked a great deal with them of the nature of the Great Desert and the possibility of crossing it, and two of my companions, Shaikh Muhammad bin Mansur of the Al Wahibah and Mazar bin Naif of the Awamir, had repeatedly protested their readiness to take me across, declaring that in the winter we should have no difficulty with good camels and a good bundobust. They would propose to take 15 men, 5 Al Wahibah, 5 Awamir, and 5 Daru, and of course only picked Badawi camels able to go for many days without water. They declared that as far as getting me across was concerned they could guarantee success; all the misgiving they had was as regards our reception by the Badawi when we reached the other side: that, they said, must be my responsibility and would need careful previous arrangement in order

to ensure friendly treatment. These conversations imbued me with serious thoughts of contriving an expedition to attempt the crossing from Adam or the furthest possible base on the desert fringe in that direction, but my transfer to Bushire soon afterwards, and the publication of an article by Mr. Bacon suggesting a crossing by balloon, turned my thoughts in other directions. Probably the riddle will be solved by air in the course of time, but it does not appear to be a practicable proposition for the existing aeroplane.

After a quiet night I went out early with the Akid or commander of the fort to look round Nizwa and take a few photos, including one of the old Persian Bazaar known as the "Suq el Faris." I also took a picture of a cultivator churning indigo vats in the date gardens, and a view of two of the main street and fort. I then entered the fort with the Wali and was shown all over it, taking a view from the top and a photo of one of the Hazrami garrison occupying his leisure, in these piping times of peace, at the loom, in one of the gun embrasures.

Wellsted has given a description of Nizwa fort. It is a very strong one and renowned in the annals of Oman. It contains a capacious water reservoir, but at present no battery to speak of; there is, however, an interesting old gun in the basement bearing the Portuguese arms, but with a Persian inscription round the touch-hole mentioning the name of Padshah Shah Abbas. The Wali says the gun is said to have been brought from the island of Hormuz, and that would seem probable.

While at Nizwa I received another letter from Muscat telling me that H.M.S. *Amphitrite* had not left England till May 6, so she could not reach Muscat for some days after the date first announced: this was a great relief to me. Shaikh Rashid also received a letter from the Sultan by the same messenger, in which H.H. gave him the news that 200 Omanis had been killed by the Portuguese in East Africa. On this occasion a fleet of Omanis dhows from Sur, while engaged in loading up a very large consignment of slaves, was cornered by a Portuguese man-of-war and all captured or killed and upwards of 700 slaves released. 150 of the Omanis who were captured were sent to the Portuguese penal settlement in Angola on a sentence of twenty-five years, and I imagine that those who survived are still there.

During the forenoon of this day, May 20, it clouded over and in the afternoon some nice rain fell. Every one was transported with delight at this welcome visitation, as there had been a long-continued drought. Birds and frogs held high revel, and it was the greatest pleasure to feel and smell the rain.

I noticed that the population in general were in a highly nervous state and easily alarmed. One only had to hear a rifle-shot or two and every one got the wind up. It was significant of the unsettled state of the country and unsatisfactory relations prevailing between one tribe and another. For example, while out for a walk on the outskirts of the

town, I said I should like to go up to the top of a nice-looking tower about 500 yards off to get a view of the oasis, but my companion said it would not be safe to go as it was a Bani Riyam tower, and we should certainly be fired at—and this was within a stone's throw of his own house.

I was sorry to leave Nizwa where everybody had been very friendly and civil to us. Between Nizwa and Samad al Kindi, my next stop, only 2 miles away, is an unbroken stretch of date gardens. It was considered politically desirable that I should halt at Samad al Kindi for the following reasons: The Shaikh of the place, Hamdan bin Saif, who proved to be a fair aristocratic young man of about thirty, was at feud with his cousin at Tanuf. In the days when their grandfather Shaikh Sulaiman ruled both Tanuf and Samal al Kindi, his two sons, Saif and another, had a bitter quarrel. It developed into a resort to firearms, and in the fray Saif shot his brother and his brother's daughter and lost one or two of his own adherents. He thereupon fled to Samad al Kindi and remained there, while the dead brother's family stayed on at Tanuf. The feud of course smouldered on, and one day Himyar, son of the dead brother and brother of the dead girl, succeeded in shooting his uncle Saif dead while at prayers, and then returned to his stronghold at Tanuf. The result is that both families now go in fear of their lives, and venture out very little. It was feared that if I paid attention only to one branch the others might lay themselves out to defeat my plans in order to do a bad turn to their rival. I had to spend the night at Samad al Kiudi, and as the gardens were full of mosquitoes, Shaikh Rashid and I went and slept out in the open plain. In the morning I got off betimes and arrived at Tanuf, a distance of about 7 miles, in a couple of hours, our direction seeming to be due north the whole way. Tanuf is situated at the base of the mountains blocking and commanding the entrance to the ascent up the Wadi Tanuf to the plateau of the Jabal Akhdhar.

I found Shaikh Himyar a fair-complexioned young man of much the same age and type as his cousin in Samad al Kindi, but smaller in stature. He gave me a salute from his tower with an old cannon, and there were the usual evolutions outside the town, followed by a gathering in the guest house, a long building (50 feet by 15 feet), while coffee was being served. Small talk for public consumption on these occasions soon gets exhausted and the long waits are very boring. Arabs themselves do not seem to mind sitting speechless for an indefinite time, tapping the ground with their canes, but it is extremely boring for Europeans.

As soon as I could I adjourned to my own quarters. The Shaikh came in to see me after breakfast. I had difficulty in getting him down to anything definite as regards my journey, and we parted without having arrived at an understanding. I came to the conclusion that greed was at the bottom of his intractability, and that he was out for blackmail, and this was soon confirmed. On leaving me he went to my pilot, Shaikh Rashid, and said that the Sultan some time ago had

promised him a Lee-Metford rifle but had never sent it, and he wanted to know why. Shaikh Rashid offered him his own, saying he knew nothing about the Sultan's promise, but in any case would send him a new one from himself and me when we got back to Muscat. The Shaikh did not come in to me again during the day, but was busy making every sort of ridiculous difficulty, including the old chestnut which I had so often heard, that as the result of Col. Miles' visit five and twenty years before, a blight had fallen on the fruit. Also that the people were alarmed by my camera and prismatic compass—all bunkum. Finally, he made specific pecuniary demands on this and that score, which amounted in all to 500 Maria Theresa dollars, about £50, to be paid in advance. I replied that I was the Sultan's friend, travelling for my own pleasure and enjoyment in H.M. country, accompanied by his most well-known and respected retainer, and bearing all necessary letters of introduction, and I absolutely refused to pay any blackmail, either 500 dollars or any sum at all. He must either let me through without any offensive conditions or I would go straight back to Muscat and lay the matter before the Sultan. I heard no more that night, and turned in somewhat worried but hoping for the best. In the morning with the dawn donkeys were produced and our frugal baggage loaded up, and about 6 a.m. in came the Shaikh in a most amiable mood, smiling as if there had never been any unpleasant question between us, and announced that he was going to accompany me himself. Accordingly, at 6.30 we started on our way, Shaikh Rashid, Shaikh Himyar, my servant, and I, all on foot, with four donkeys with our food and bedding following on behind. The ascent was very steep to begin with, and distressing for the first two hours owing to the heat and the sun blazing straight into our eyes. At 8.15 we had an easy while the Arabs had a cold breakfast of dates and dried shark flesh. They cut or hammered off great chunks of the shark meat, and after beating it into a fibrous state picked it to pieces and ate it. After about four hours' walking at 2½ miles an hour we came to a rain-water cistern in the rocks, formed by blocking up the side of a deep cranny in the nullah. Here under the shadow of an overhanging rock we halted for the hot noon-day hours, and in the afternoon intended to do the second half of our journey to Saiq; but about 1 o'clock, just as I was ready to start, some villagers brought in a goat, and it appeared absolutely necessary to my party that the goat should be eaten immediately, so we were considerably delayed in getting off, and after walking for two and a half hours at about 3 miles an hour, we found it was too late for us to reach Saiq that night. (I may mention that my companions generally used the diminutive form of Suwaiq for this village.) Meanwhile we reached the Wadi Habib, which gives its name to a small village of about thirty houses of Bani Riyam. It was built up the side of a deep nullah and reminded me very much of a Kashmir village. As we descended the series of steps down the side of the nullah in single

file, the villagers all passed up one by one, each clasping our hand in one or both of theirs and uttering their rustic greeting, " Marhaba-Bakum " (" welcome to you "). On getting down to the bottom of the nullah we were shown to an open carpeted platform (for the entertainment of guests) in the bed of the wadi, surrounded by a mass of pomegranate and walnut trees. One fine walnut tree formed a canopy to the guest house, as the acacia tree did at Jabrin. All this time it was thundering and lightning and the sky looked very threatening. Our hosts inquired if I would like to sleep out in the open or under the trees. I replied, as it looked like rain I would prefer being under the tree or even in the shelter of a house. They assured me it was not going to rain, but our donkeys had hardly arrived and shot my things down under the tree when it came on to rain in torrents, and our baggage got very wet before we could get it into shelter. The villagers were very kind and friendly, however, and helped us to carry our things into shelter and fetched water and wood for us, and with a change of clothes and a fire we were all soon comfortable and ready to turn in. I did not sleep very well, as I was tormented by some biting insect which attacked my hands and wrists; I could not hear any buzzing, so concluded that my visitors were those of the silent order.

In the morning I got my tea at daybreak, and then strolled out with my camera and gun and collected one or two birds while the donkeys were loading up.

Saiq proved to be only 4 miles distant, and I found it a disappointing place, like the ordinary Baltistan village: stone houses plastered with reddish earth and with flat mud roofs, and with a succession of orchards in front. There was a certain amount of wheat and barley cultivation in terraces, and a good show of mulberries, peaches, and apricots, but the main cultivation was in the form of a fine show of pomegranates. After halting for a short time to look round we continued our march to the village of Sharaija—so pronounced by the inhabitants.

Miles and Wellsted spell the name Shiraizi, connecting it with Shiraz, but I am inclined to doubt whether it has any such connection. I believe it to be the same root as Sharga or Sharja, and to be a diminutive of that form. It is a larger and more picturesque village than Saiq, situated at the head of a fine canyon facing south-west and looking down towards Birkat al Moz. The sides of the wadi are very massive and steep, and it is altogether a grand bit of scenery. According to Miles, who went from here to Birkat al Moz, the terraces of cultivation go right down the Wadi Mi'aidin, for 1000 feet or more. My poor old pilot Shaikh Rashid was beginning to look very tired and sorry for himself; probably he had never had to walk so much before in his life. After partaking of the usual coffee we were conducted through the busy portion of the town to the so-called guest house, two compartments on the ground floor which had been used as stables being set apart for our

use, one for our donkeys and the other for ourselves. The floor was covered with litter, which we proceeded to clear away as far as possible. I expect this is the place that Wellsted mentions, and in which he would not stay. The villagers told him this was where travellers were always accommodated. Since Miles' visit in 1885, only one European had visited Sharaija, one whom they called "Butros." They referred no doubt to the missionary Peter Zwemer, the brother of the Rev. Samuel Zwemer whom I mentioned at the beginning of this paper as having travelled from Abu Dhabi to Baraimi. Peter Zwemer died of fever in America very soon afterwards.

Just below the guest house was a fine circular reservoir, fed by a spring, in which at the time several lads were bathing. The season, it will be remembered, was the end of May and excessively hot in the sun. I sat and looked on longingly until our donkeys came, when I got out my bathing suit and had a dip, but the spring water was too ice-cold for me to stay in long. While sitting at the pool I talked to some villagers, and one of them of course repeated the old story about Col. Miles and the blighted fruit trees. I tried to demonstrate the foolishness of it, and went on to say that anyhow on this occasion please God my coming was propitious, for wherever I had stopped I had brought rain after prolonged drought, as for instance at Nizwa and at Wadi Habib last night. The words were hardly out of my mouth when a storm began to work up overhead, and before long we had heavy rain, and it continued all the afternoon; pleasant for them but not convenient for me, as it obscured the view and greatly hampered my photographic activities. My Tanuf friend Shaikh Himyar here took his leave, as he feared for his life if he went further afield then Sharaija, saying that if his hostile relations heard that he had got down to Muti they would be able to cut him off. He apologized humbly for his uncouth conduct at Tanuf, and pleaded that it was due to his ignorance of our usages! He certainly had been very helpful since we started, and his presence had ensured me a friendly reception on the Jabal, and so on Shaikh Rashid's advice, which I felt bound to follow, he was promised a Lee-Metford rifle and 100 dollars, to be handed over to his representative on our arrival at Samail. He sent a local Shaikh, Yunas by name, to represent him as far as Muti, which was the limit of the Bani Riyam.

That evening we went on to the Sharaija suburb called Ain, where we slept in a dirty little stone hovel; it was not so bad however as it looked, and no insects kept us awake. We were up and away with the lark, and I was just congratulating myself on having a long day in front of me when we were stopped, by arrangement apparently, at the next hamlet of Aqar by a deputation bringing coffee and food for myself and followers. Shaikh Rashid swore that the repast should not take more than half an hour, but it was 7.30 before we got off again. From Aqar our way lay at an angle of 150° across the Wadi Miakal, some way down which lies

the village of Hail, to which however I did not digress. Our path went up and down one ravine after another, with a general rise to the crest of the range just below the peak called Khadhar. We must have gone up 800 feet since leaving Sharaija, and at our highest point the summit of the peak appeared another 500 feet above us, and our course took us almost round it. Then standing practically on the summit of the range between 7000 and 8000 feet high you have a grand panorama spread out before you—Muti, Qarut, Birkat al Moz (the town just hidden), and then more to your left the Wadi Halfain and other scours from the water-shed tailing out like ribbons into the plain and losing themselves in the distant haze of the desert. This is the point at which I would like to start a survey if I had to make one, and then go across to Sharaija and Saiq and thence along the crest northwards to the end of the range. The northern portion of the plateau has yet to be explored, and it was a great disappointment to me that the advent of H.M.S. *Amphitrite* made it impossible for me to remain longer on the Jabal. It had taken us two hours from Sharaija to reach the crest; our descent then commenced. For the first 300 feet there was no made track, but the slope was easy and gradual; then we reached a col with a little misjid perched on it. From that point the drop of some 3000 feet into the Wadi Halfain is down a road of steep (and too steep) steps said to have been made by the Persians. It took us two hours to get down, practically without a stop, and I found it particularly trying on one's thigh muscles. Moreover we were descending from a nice climate into a furnace. It was 2.30 by the time we reached the bottom, and my poor old pilot Shaikh Rashid was quite played out. On the way down the only persons we met were two young women going up the hill to collect "boot," a species of coriander.

On reaching Muti we found that the rest of our party who were to have met us here with our camels and caravan had not arrived from Izki (Ziki), so we sent a messenger to tell them to hurry up as they ought to have been awaiting us.

After taking some tea I took a walk round about and looked at the view up and down the nullah, and took some compass angles and a photograph. Meanwhile the caravan and escort turned up, together with a lot of Bani Ruwaha tribesmen. Shaikh Rashid was convinced that they had come to squeeze us, and was therefore anxious to get off at once, tired though he was. Meanwhile two messengers arrived with letters from Muscat saying "all well" and ship not yet arrived.

Starting forthwith, we reached the najd of Qarn ad Daru (two small hillocks) at midnight, Wabal at 2 a.m., and going all night arrived at Samail at daybreak, and from thence we rode into Muscat as quickly as we could during the day, arriving just in time to greet H.M.S. *Amphitrite*, in which I proceeded on a "show-the-flag" tour round the Gulf ports—a very hot tour, I am afraid, at that season of the year for a ship's company straight out from home.

If I may trespass on your patience for a few moments longer I should like to touch briefly on the natural history of Oman before I conclude.

Only two of my predecessors appear to have taken any lively interest in the subject, namely my friend Col. Jayakar, of the Indian Medical Service, and Col. Miles. The former, a Mahratta by origin, was Agency Surgeon at Muscat for some five-and-twenty years, including my time there, and was a man of great industry and scientific bent. He made a very fine collection of the fishes of those waters, which he sent to the British Museum together with other smaller collections which he made from time to time.

I do not think he ever left the precincts of Muscat itself, but he always kept a vigilant eye for any natural-history object likely to be of scientific interest, whether bird, beast, or fish.

Col. Miles, situated like myself, used what opportunities he could snatch during his tours inland to collect specimens, but it will be realized, I think, that travelling under the conditions that he and I did, satisfactory collecting was no easy matter.

As regards mammals, the following seem of particular interest in the Oman fauna :

Oryx Beatrix. The Beatrice Oryx named after Her Royal Highness Princess Beatrice.

Hemitragus Jayakari. Jayakar's Thar, named by Mr. Oldfield Thomas from two skins sent home by Dr. Jayakar. It has never been obtained or seen in its native haunts by any European sportsman.

Gazella Muscatensis. The Muscat Gazelle.

Gazella Marica. The Reem Gazelle.

A small hare (*Lepus Omanensis*).

A Hyrax and a Civet.

The latter is apparently the same form as that found in India and beyond and on the island of Socotra, and though now indigenous was probably at some period imported.

Among the birds only about 120 species have been collected by Col. Jayakar, Col. Miles, and myself, so that a great deal remains to be done.

Perhaps the most interesting items are :

The Muscat Bee Eater ;

The Arabian See-see partridge ; and

The black-headed Arabian Chukor partridge.

When it becomes a little more accessible to travellers, Oman will offer to the naturalist a field which has been very little worked.

Before the paper the PRESIDENT said : Our lecturer this evening is a gentleman who requires little introduction to an audience of this Society—Sir Percy Cox, whose acquaintance with the Persian Gulf and with the countries which hem it in on north and south has indeed been a prolonged one, starting from the time when he first proceeded as Consul and Political Officer to

Muscat in the year 1899. During that period, as he has risen from post to post—from Consul to Consul-General; from Consul-General to Political Resident in the Gulf; and then again after a period of service as Secretary to the Government of India in the Foreign Department, and as Chief Political Officer with one of the Indian Expeditionary Forces to the post of Acting Minister in Persia; and finally, to that of High Commissioner for Mesopotamia—Sir Percy Cox has rendered service to Great Britain of which his fellow-countrymen may well be proud. But it is not in the guise of a statesman or diplomat that he comes before us to-night. He is with us as a traveller who has made excellent use of the opportunities which his official position has provided from time to time of exploring some of the lesser-known parts of the Middle East. The particular journeys which Sir Percy Cox is to describe to us were undertaken a good many years ago into the thirsty hinterland of Oman. Few European travellers had penetrated to that little-known part before, and those who had had given somewhat meagre and perhaps not too accurate accounts of its geographical features. Sir Percy Cox to-night will be able to fill in the lacunæ left by the very few travellers who preceded him, and possibly also to make some corrections in the geographical data which they have given us. I have now much pleasure in calling upon him to give us the account of his journeys.

Sir Percy Cox then read the paper printed above, and a discussion followed.

The PRESIDENT: There are not very many who can speak with first-hand knowledge of Arabia, but prominent amongst those who can is Mr. Philby. I will ask him if he will say a word or two.

Mr. H. ST. J. B. PHILBY: I am sure you have all listened, as I have, with the very deepest interest to the account that Sir Percy Cox has given us of his travels in the Oman hinterland. There are a great many points which suggest comment on my part, but I must be brief. First, as to the question of climate. Sir Percy Cox has told us something about the horrors of "Elphinstone" Inlet, where the Indo-European Telegraph Department were scarcely able to keep their employees alive; he referred also to the heat at Baraimi, but said nothing very discreditable about the climate of Muscat, where he and Lady Cox are said to have spent five years. I suppose he refrained from telling us of the climate for a particular reason; for fear, for instance, that nobody would believe him. I think you will agree with me that neither he nor, if I may take the liberty of saying so, Lady Cox are particularly convincing advertisements of the unhealthy nature of the Persian Gulf climate in which they have passed not only five years, as one might have thought from to-night's lecture, but rather more than a quarter of a century. I am sure that both would willingly return and spend another quarter of a century in the same parts if they had a reasonable chance. I am sure that Lady Cox, at any rate, would prefer to do so, rather than stay in our own wretched climate. I should like to suggest that the secret of success under such conditions is obvious. You must like a place and your work in it so much that you have absolutely no time to think of its drawbacks and disadvantages.

Sir Percy Cox has referred to his travels as mere excursions. Well, they may have been; but mere excursions in countries which are unknown, or very little known, are apt to have a very considerable geographical importance, and this is no exception to the general rule. The fixing, for instance, of a place like Baraimi is a very definite geographical achievement, and so far as I

know, though I may be wrong, there is no other recorded instance of the successful manipulation of a ship's chronometer at any distance within the interior of Arabia. That is a very great achievement. Then the journey of more than 100 miles or so from Ras al Khaima to Dhank over territory which, except for Baraimi, had never been travelled by a European is something of a geographical achievement. And when I saw the map on the screen this evening it seemed to me that there were a good many additions as compared with the maps one is accustomed to see of that part of the world, and every addition represents a definite advance on the total sum of human knowledge. It seems to me a great pity that all the interesting information we have received this evening has been allowed to lie hidden in the dusty archives of the India Office for a quarter of a century. At any rate, better late than never, and after to-night they will be on public record in the pages of the *Geographical Journal.*

There is another point I should like to make. Although other preoccupations of perhaps greater importance have militated against Sir Percy Cox extending his Arabian excursions further into the interior, he has really made ample amends to humanity for this very serious shortcoming on his part, for he has never missed a chance of placing in the way of others opportunities to travel that circumstances denied to him. Only a short time ago Major Cheesman, to whom the Society has to-day awarded one of its great honours, was able to tell you that it was to Sir Percy Cox that he owed the chance he had of making that great expedition to the Jabrin Oasis, and I would like to take this opportunity of adding that it was also to Sir Percy Cox that I owed my year of very delightful exile in Central Arabia. I would go further and say that if, as I venture to predict, the twentieth century does for Arabia what the nineteenth century did for the exploration of Darkest Africa, and if that very large and ugly yellow horrid blank which we saw to the south of the central part of the Arabian map ceases some day to be large, yellow, ugly, or blank, the credit will be largely due, although indirectly, to Sir Percy Cox.

There is one point to which Sir Percy has not, I am sorry to say, had time to refer, though it is raised in his paper, which will in due course appear in the *Journal.* Sir Percy Cox quite calmly suggests that the riddle of the Great Desert, one of the greatest riddles remaining for geographical solution at the present day, could be solved by aircraft. I think that is a perfectly horrible suggestion. I hope we shall hear no more of it. But again referring to his paper and not to what he said to-night—I am sorry he had not time to say it—it is very interesting to me to note that the information he got on the Oman side of the desert exactly confirms and corroborates in detail the information which I was able to collect on the other side at Wadi Dawasir; that is to say, on the north-west side. It is of very ominous significance that the very three tribes that he mentioned in his paper in connection with crossing the desert are the very three tribes that my friends from the other side told me they were in the habit of raiding. That is very interesting, but in the circumstances it would, of course, be very important to make quite sure of the kind of reception one is likely to get on the other side before starting. But there is—and Sir Percy Cox is able to support this—no really insuperable difficulty in the way of such a venture, though any attempt ought to be made, not by aircraft, but in the ordinary way of riding there on the back of a camel, and not behind the hump! And I would say that I think one has every right to ask His Majesty's Government not to add unnecessarily to the natural difficulties of such a venture by putting official obstacles in the

way of those who are foolish enough to want to do anything so silly. After all, there are some people in these days of overcrowded populations who could easily be spared from this world, and if the worst came to the worst—and the person taking the risk would take care that it should be as small as possible—one would not really expect His Majesty's Government to send battalions of infantry into the waterless wastes to avenge one's death. I speak with a certain amount of feeling and reason on that particular point.

Sir Percy Cox, you will remember, had to hurry over the last part both of his lecture and his journey ; the reason for the latter was that he had to catch H.M.S. *Amphitrite* in order to join her for the purpose of a cruise in the Persian Gulf, the object of which was to show the British flag. I venture to think he did not justify the precipitancy which he showed in the matter. He, it is true, went down to join the *Amphitrite* to show the British flag, which after all was well enough known in those seas, but the *Amphitrite* could, I am sure, have shown the flag under less expert guidance than that of Sir Percy Cox. I would suggest that he was engaged in a very much more important task in showing the flag in an area which on his own showing was an area which did not know the flag. It is interesting to remember that a succession of British visitors to those parts has resulted in a progressive improvement in the manner of the inhabitants thereof. For instance, as Sir Percy told us, Wellsted had a poor reception at Ibri, whilst fifty years later the next visitor, Colonel Miles, had quite a good reception at Ibri, but rather an uproarious one at Mazum. Sir Percy went through both with flying colours ; in fact, he got to Tanuf before he had trouble, and that only of a mild order. If only every British political agent in Muscat, once in the course of his incumbency, would make an excursion into the interior until he was stopped by the rudeness of the natives, the interior of Oman would in the course of a few centuries come to be as well known as it ought to be considering the length of time that it has been under the benevolent protection of Great Britain ; and the same applies to an almost greater extent in the case of the Aden hinterland.

There is another point of considerable importance, and one on which I feel somewhat strongly. You will realize from what Sir Percy Cox has said that all his predecessors in the exploration of that part of the country, the hinterland of Oman, number no more than three, and those travelled there at very wide intervals—1835, 1885, and 1901. In the circumstances I think it would be permissible and excusable to call Sir Percy Cox's attention to a somewhat serious omission. I seem to remember some time ago—and I refreshed my memory on the subject to-day—that Palgrave, in speaking of his travels in Arabia, mentions having made certain little excursions of the same description that Sir Percy told us about to-night, into the interior of Oman from Muscat. They were nice little excursions. I was trying to puzzle out the geography of them this afternoon, but the misfortune is this : that all the places at which Palgrave stayed, and where he was entertained, appear to have disappeared from the map. I should like to have heard what Sir Percy Cox thought of those excursions, and I regard his omission as a little strange in view of what he appears, according to the official report of the Society, to have said at the meeting at which Major Cheesman read a paper. He there made a definite attempt to support the reputation of Palgrave. It is a long time since I talked about Palgrave, and I do not propose to talk very much about him this evening. As, however, I was not present at the meeting at which Major Cheesman took advantage of my absence to resuscitate the Palgrave bogey and was supported by Sir Percy Cox and Dr. Hogarth, I

would like to take this opportunity of exploding a little theory in regard to which Dr. Hogarth is very persistent whenever he rises to defend the memory of a man who, after all, cannot defend himself. I have no objection to his doing that. But Dr. Hogarth explains Palgrave's admitted digressions from the path of strict truth on the ground that he had the great misfortune to be shipwrecked, and that during that shipwreck he lost all his notes. A statement of that kind made before a Society of this description by a person of the kind that Dr. Hogarth is ought to be considered absolutely convincing, for Dr. Hogarth is the greatest living authority on Eastern questions, and on Arabia in particular. I am very sorry indeed that Dr. Hogarth is not here this evening, because if he had been I should like to have asked him on what authority he makes the statement that Palgrave lost his notes on the occasion of his alleged shipwreck on the coast of Oman. He certainly did not get it from Palgrave himself, who goes out of his way to explain that he was rather proud at not having lost his notes on that occasion. As a matter of fact, on 23 January 1863, after his reputed wanderings in Arabia, he parted from his friend Barakat, who afterwards became an Archbishop, and to that man he consigned all the notes he had taken during his wanderings, and he goes out of his way to tell us that he took that precaution because he had a presentiment that he was going to be shipwrecked, and he adds that if he had not taken that precaution his book would never have appeared. The notes were perfectly safe and sound when Palgrave, after his shipwreck, rejoined his friend. He was duly shipwrecked according to his presentiment, but he had taken the precaution to preserve his notes; the only ones lost were those between 25 January 1863 and the date of the shipwreck, March 10. But even that line of defence does not explain Palgrave's vagaries in describing Oman, which he visited after the shipwreck. There is one more point suggested by the mention of Palgrave. Sir Percy Cox had considerable difficulty in regard to the name of Jabal Hafit, and says that Dr. Samuel Zwemer calls it "Jebel Okdat" or "Jebel Akabat." But why does he single out Dr. Samuel Zwemer? After all, the authority for the name of Okdat was Palgrave, and one of Palgrave's companions was actually a resident of the village of Okda. That seems to have escaped Sir Percy Cox. As a matter of fact, he is no doubt right in saying the name of the hill is Jabal Hafit after one of the villages at its foot; but if there is a village Sir Percy Cox has not seen on the other side of the foot called Okda, the hill might quite well be called Okdat also. The Arabs moreover have a peculiar method of nomenclature. They may call a place by what it looks like. Sir Percy told us Jabal Hafit was a ridge about 20 miles long, with a pass or col in the middle. That is what the Arabs would call "Aquabat," meaning a pass. I am not sure about his interpretation of the word Okdat in Arabic. It may mean "sandhill," but I should expect it rather to refer to a difficult pass between sandhills; the word "Okda" ('Uqda) of course means a knot.

The PRESIDENT: If there are no other speakers I will convey to Sir Percy Cox the gratitude of this meeting for the time and trouble which he has taken in resuscitating the notes of his journey and giving us so delightful an account this evening. We now regard him as a most admirable photographer, for he showed us this evening one of the finest series of views of desert country which it has ever been my fortune to see.

Note added by Sir Percy Cox:

Owing to the lateness of the hour it was not possible for me to make any rejoinder to Mr. Philby's observations; but as it is of some little geographical

importance to clear up as far as possible existing doubt as to the name position, and extent of the "Jebel Okdat," it may be convenient if a summary of the record accompanies this paper. The italics are mine.

1835. Wellsted, in the map accompanying his 'Travels in Arabia,' shows a Jebel Okdat range, but in quite a different position from that discussed above. Wellsted's range begins 40 miles south of Baraimi and continues for 20 miles in a south-south-westerly direction. He shows no hill feature near Baraimi, which he places about 15 miles west of its true position. He did not himself reach Baraimi, so what he recorded was necessarily from hearsay.

1863. Palgrave, in his 'Eastern and Central Arabia,' writes: (*a*) (vol. 2, p. 301):

> "On the morning of 16 February 1863 we sighted the Oman coast between Aboo-Debee and Dobey—long, low, and sandy, but well lined with palm groves and villages arranged along the glistering shore. *Far in the distance like a cloud rose the heights of Bereymah or Djebel Okdah. . . .*"

(*Note.*—From Palgrave's position at the time, in a sailing vessel some miles from the coast ("in sight of the coast," he says), the Bereymah Oasis could not have been much less than 100 miles distant.)

(*b*) Vol. 2, p. 339. Referring to his companions, on his voyage by dhow from Sohar to Muscat, during which he was ultimately wrecked, he writes:

> "Besides these we had on board ten other fellow-passengers: two from Djebel Okdah . . . I now learnt from the men of Okdah many particulars regarding Bereymah and Dahireh, which may here find place. Of Bereymah itself they said that the town was strongly nestled amid the passes of the Djebel Okdah; . . . that Djebel Okdah itself was a lofty mountain equalling in height the range of Roos-el-Djebel: that the soil was light and the vegetation not less luxuriant than the Batineh; that beyond the Djebel Okdah extended, east and south, a long series of hills parallel to Djebel Akhdar."

(*Note.*—In the foregoing Palgrave does not mention or necessarily imply that there is a village of Okdah, and neither Miles nor I heard of any; but as regards the mountain range, even if the meaning—"sandhill"—which I suggest for Okdah, with good authority, is accepted, it is no doubt conceivable that Okdah—"Sandhills village"—and Djebel Okdah—"Mount Sandhills"—may be used synonymously for Hafit. Palgrave places Bereymah in approximately its correct position, but he shows a mountain feature, representing or including his Djebel Okdah, stretching from a point 30 miles north of the oasis to Bahla, 120 miles south, *i.e.* 150 miles in all, whereas the feature, whatever its name, is actually 20 miles in length.)

1871. In the map issued by the Hakluyt Society in 1871, in connection with the Rev. G. P. Badger's 'Imams and Seyyids of Oman,' Jebel Okdat is evidently inserted on the basis of Palgrave's erroneous location of the feature.

1885. Now let us hear Colonel Miles on the subject. In his Muscat Administration Report for 1885-1886, he writes:

> "The Wadi Dthank and the Wadi Boo Karba both join the Wadi Safa, a large watercourse in the Ramool desert, running to Abu Thabi, almost parallel to the Wadi Ain: *the Jebel Okdat of Wellsted is purely mythical; there is no such range in that direction whatever except Hafit, near Beraimi.*"

When Miles passed up to Baraimi from Sohar in 1875, he came in full view of Hafit or whatever the mountain feature was in that neighbourhood, and when making the above remark he makes it from first-hand knowledge;

furthermore, he shows Jabal Hafit as an isolated mountain and in its correct proportions in the paper on his journey contributed to the *R.A.S. Journal of Bengal*, vol. 46, p. 41, 1875–76.

1902. Dr. Zwemer, in the *Geographical Journal* for January 1902, p. 62, writes:

> "On Tuesday we reach the oasis of Beraimi, a 4-mile stretch of fertile palm country under the shadow of Jebel Hafid, *the first spur of the Okdat Range*. It seems, after careful inquiry from several Arabs, that the true name or at least a second name for this mountain range is Jebel Okabat. The first name signifies 'knots,' the latter 'deep defiles': both names are appropriate to the rugged outline of the range as seen from the desert. . . . *Beyond Beraimi, the road along the Jebel Okdat range passes the following villages:* Hafid, Senanah, El Felai, Dank (or Danj) Jabil, Subaihi, Mamur, *Abri*. . . ."

I think it may be fairly deduced from the above, and from my personal observation and notes, on my way from Baraimi to Ibri, that while the expression Jabal Okdat may well be used by local Arabs synonymously for Jabal Hafit, there is without doubt, no continuous mountain range in the locality in question other than that referred to by Colonel Miles and myself as Jabal Hafit, a feature starting 5 or 6 miles outside Baraimi and stretching for 20 miles southwards. Wellsted went off the line in the first instance, and apparently Palgrave, Badger's cartographer, and Zwemer followed him.

P. Z. C.

THE DEMARCATION OF THE TURCO-PERSIAN BOUNDARY IN 1913–14

Col. C. H. D. Ryder

Read at the Meeting of the Society, 8 June 1925.

THIS Turco-Persian Boundary, the delimitation of which in 1913–14 I shall describe, is a boundary with a past. It is remarkable, if for no other reason, in that the three main efforts to settle it have each been interrupted by a great European war. Without delving too far into remote ages, the Turco-Persian frontier more or less assumed its present position early in the seventeenth century; frontier forays from both sides were of constant occurrence, as was only to be expected in a country peopled with independent warlike tribes far removed from the very slight influence that could be exerted over them from either Constantinople or Tehran. I doubt whether there was ever any keenness on the part of the tribes themselves to have any general settlement of the frontier at any time; there is so much more fun and freedom in the raiding line when nobody knows exactly where the frontier lies.

By 1842 however the British and Russian Governments became closely interested in the matter, a joint commission of investigation being despatched to the scene. Amongst the British Commissioners were Colonel Williams (the famous defender of Kars in the Crimean war) and the Hon. Robert Curzon, a cousin of the late Lord Curzon. They seem

to have had many adventures; amongst them, the Turkish salute of welcome at Erzerum including a gun charged with round shot carefully aimed at and only just missing the British Commissioners.

The result of their efforts culminated in the Treaty of Erzerum, under which a commission of delimitation was appointed. The only records remaining are in the diary of the Russian Commissioner, Colonel Williams' papers being all lost in the Thames on their arrival in this country. The Commission wandered up and down the frontier zone from 1848 to 1852 in a leisurely manner, retiring to the hills for the summer. Their labours were also somewhat delayed by one of the rival commissioners every now and then breaking loose and building pillars on his own where he thought the frontier ought to run. Subsequent negotiations were broken off by the Crimean war, on the conclusion of which the British and Russian surveyors met at St. Petersburg, and after eight years' labour produced two separate maps. These were compared apparently for the first time after completion, and 4000 discrepancies were discovered in the first eight sheets. Nothing daunted they put their heads together and in another five years, *i.e.* in 1869, produced a joint map many yards in length entitled the "Carte Identique," a most beautiful artistic production. Unfortunately its accuracy was not equal to its beauty. How those 4000 discrepancies were adjusted no one knows; it must have been by splitting the difference or alternately accepting the British and Russian ideas on each detail.

Further discussion for another five years resulted in only one point of agreement: that the frontier lay somewhere in the country covered by the map, a zone occupying a width of 25 miles. Again was a settlement interrupted by the Turco-Serbian war, followed by the Russo-Turkish war of 1877. It was not until 1913, after another twenty-five years occupied by endless discussions in Constantinople and many frontier episodes, that a protocol was signed by all four powers concerned laying down on paper where about three-quarters of the frontier should run, and appointing our Commission to settle the remaining quarter and to actually demarcate the whole on the ground.

By this protocol the British and Russian Commissioners were appointed arbitrators in the case of the Turkish and Persian Commissioners being unable to agree; and more, important still, the latter two Commissioners had to submit to the arbitrators within forty-eight hours a statement of their cases: an invaluable proviso where the surroundings were pleasant, bad water, which we so often met in Mesopotamia, running it a close second as a spur to our decisions.

We commenced to assemble in December 1913, work began in the following month and ended in October 1914, by which time we had travelled from the Persian Gulf to Mount Ararat, demarcated the whole 1180 miles of the frontier (except 40 miles near Qutur), erected 227 boundary pillars, and made new surveys of the whole area concerned,

THE KARUN

KUSHK-I-BASRI, NORTH OF MOHAMMERAH

PROCEEDING TO THE FIRST BOUNDARY PILLAR UP RIVER FROM MOHAMMERAH

CROSSING THE KARKHA AT KUT SAIYID ALI

COMMISSION SEARCHING FOR THE SHATT AL AMA

BAKUBA ON THE DIYALA

except where the frontier ran along well-defined natural features about which there could be no doubt.

From our meeting-place at Mohammerah we began delimitation by steaming down the Shatt al 'Arab to Fao just to look at the boundary, which lay on the high-water line on the left bank. Our steamer the *Marmaris* afterwards took part in the fighting on the river in 1914, when it was sunk. We then proceeded with much ceremony to plant pillar No. 1 where the frontier leaves the river between Mohammerah and Basra. To reach the spot we had to proceed up a creek in large "belums," and hammered in pegs to show the position of pillar No. 1 and its neighbour which was a direction pointer, the boundary then streaking away in a straight line to the neighbourhood of Kushk-i-Basri. We then adjourned to take part in a sumptuous Arab feast, provided by the Sheikh, to which those of us with the more delicate digestions failed to do justice, owing to a negro slave walking about amongst the dishes dismembering with his hands the whole sheep which formed the *pièce de résistance* of the menu.

While this was going on, masons were at work building the pillar, which they did with much zeal; and their previous experience being limited to the building of houses, they built themselves in the pillar, and a hole had to be knocked through to let them out.

On the return journey the tide had fallen and the "belums" had to be pushed by hand over the mud, the load being distinctly increased by the sumptuous lunch we had indulged in. We then made an excursion of a few days up the Karun river, landed, marched to the ruins of Kushk-i-Basri, fixed its position, and erected pillars to turn the frontier due westwards into the marshes.

The pillars we erected were a varied assortment, sometimes proper masonry pillars, at other times piles of loose stones or even mud heaps, according to the local material available. Our stay there was marred by a heavy storm of rain; it is unfortunate that in Mesopotamia the otherwise delightful cold weather is spoilt by its also being the rainy season.

The rivers, up to the point where the tide ceases to have effect, are bounded by thick palm groves; beyond this the occasional desolate group of palm trees, such as the one at which we landed, are generally shrines, the sanctity of which is so great that any one can leave his belongings there unguarded, a wonderful tribute in such a land of thieves.

We then returned to Mohammerah, which we finally left on February 17, steaming up the Karun to Ahwaz. The Anglo-Persian oil pipe line from the fields to Abadan passes along here. When it was first laid over the desert the temptation of firing a shot at it, and the resultant jet of oil spurting out, proved too great for the Arab. It was great sport. I have been told that the difficulty was got over by making the

sheikhs shareholders, thus rendering them materially interested in guarding the line.

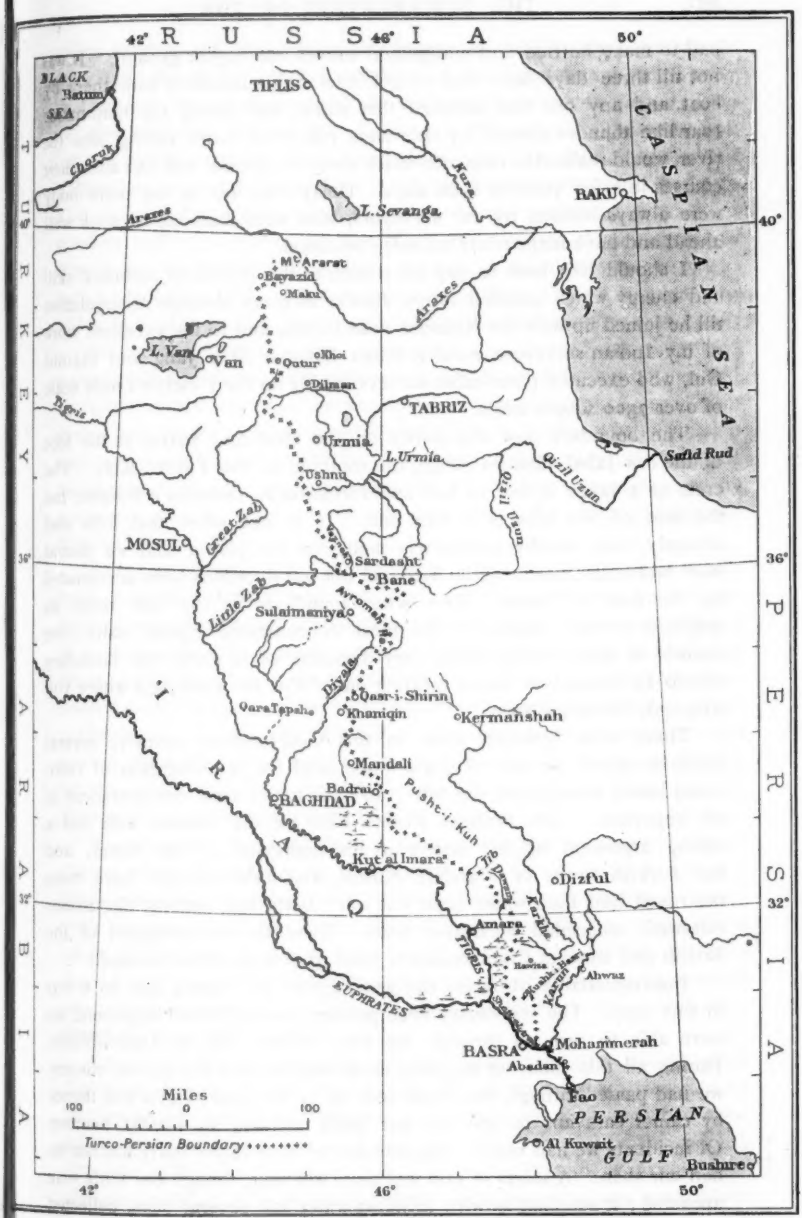
The march across the desert, where we had our first view of the enormous flights of sand-grouse, brought us to the Karkheh river, the water of which is famous for its excellent quality. Tradition has it that Persian kings would drink no other, and had relays of horsemen conveying the precious liquid following them on their travels.

This river, like its neighbours, is unruly. It used to water the prosperous town of Hawiza, but one night broke its banks, changed its course, and left the town high and dry. The town of 30,000 inhabitants is now a mere village. Properly harnessed this river should water many hundreds of square miles of fertile land, instead of as now losing itself in the marshes; the difficulty however of all irrigation schemes in 'Arabistan is the absence of industrious cultivators, the possession of a grove of date-palms providing the easiest and also the laziest means of obtaining a living, I fancy, in the whole world. The old Sheikh of Mohammerah is reported to have said that the only way of making his country progress would be by cutting down every date palm, a drastic measure, though not far from the truth.

Striking the marshes, where I caused much amusement to the Arabs by shooting snipe—such a waste of shot over so small a bird—we picked up the frontier again at a spot with the local name of Umm Chir (the mother of pitch). Arab names are often charmingly descriptive; they call a snipe the "Father of long noses," and a Sheikh described with grave politeness the visit to his village of one of our foreign colleagues who was above the average in girth: "This morning my village was honoured by a visit from the Father of bellies."

The frontier had now to follow an old river-bed, the Shatt al 'Ama, which sounded easy enough, but the problem was to find it, for there were many. After following several which petered out, we at last got on to one which answered the purpose, and although the morning had begun with much disputation, the Persians wanting us to search farther west and the Turks farther east, the heat coupled with the obvious fact that the ground, a howling desert devoid of water and vegetation, was valueless, led all parties to an agreement, and to our great relief after a long two days we finally reached the Duwairij river.

The British Commission leading the way (Captain, now Sir Arnold, Wilson being *facile princeps* in pushing ahead and pinching the best site for our camps), crossed the river and camped on the farther side, or, strictly speaking, in the bed. The river, fed by rains in the hills, then rose, and we had to make two very hurried moves before we reached safety. In a few hours a stream had become a large river and was foaming down 20 feet deep. Our colleagues had been watching our antics with much amusement, but the laugh was on our side when later in the day the river began cutting away its banks and they in their turn



Sketch-map of the Turco-Persian Boundary to illustrate the paper by Col. C. H. D. Ryder.

had to make hurried and undignified moves into higher ground. It was not till three days later that we got into communication with them by boat, and any one who watched that scene, and heard the continuous roar like thunder caused by enormous pieces of bank falling into the river, would realize the ease with which rivers in alluvial soil can alter their courses in a few years or even days. Delays like this to the main body were always utilized by our surveyors, who were enabled to work well ahead and have maps ready on every occasion.

I should like here to pay my tribute to the wonderful technical skill and energy which enabled Major Cowie to carry through triangulation till he joined up with the Russians near Urmia, and to the excellent work of my Indian surveyors, notably Khan Bahadar Sher Jang and Hamid Gul, who executed plane-table surveys mostly on the 1 inch = 1 mile scale of over 7500 square miles.

The boundary now ran partly on the crest and partly at the foot of the low Jabal Hamrin range, the foothills of the Pusht-i-Kuh. The crest of a range is not so bad an expression to describe a frontier, but the foot of the hills is a bad one. It is not often that hills end abruptly, they usually indefinitely melt into the plain; and we should have had much more trouble here had not our decisions been accelerated by the want of water. Even when found, as in the Tib river, its qualities proved similar to the most concentrated Epsom salts ever known, so that even the most fiery disputers as to where the boundary should lie became as lambs bleating out, "Put the boundary where you like, only let us get away."

There were however, even in this God-forsaken country, several localities where streams of good water, used for the irrigation of cultivated lands, issued from the hills; an oasis under such circumstances is all important. The Wali of Pusht-i-Kuh on the Persian side had a strong argument up his sleeve in his command of the water, and the Turkish towns of Mandali, Badrai, and others might have been destroyed had their water been cut off. Long and patient discussions followed, succeeded by heated ones. Even the temperatures of the British and Russian Commissioners must have been above normal!

Insurmountable obstacles can generally be got round, and so it was in this case. The increasing heat proving an additional argument, we were able to turn up through the very broken hills to Qasr-i-Shirin. During all this time our supplies, unobtainable from the barren country we had passed through, had been sent up by the river Tigris and thence by camel caravans to join us, our mails arriving in similar manner. Of incidents we had many. Sandstorms we were rather early for, but we had our share. A storm of rain was more welcome, though our tents were uprooted; it supplied us with drinking-water for several days, collected in every vessel we could find.

At Qasr-i-Shirin we had a well-earned halt while we refitted for the

colder climate of the north; our maps and reports were got up to date, while the lighter-minded members of the Commission flitted away to Baghdad to rest themselves in the delights of civilization. Even we who remained behind felt civilized. We were on the telegraph line, of which a word. For many years this line from Baghdad to Tehran had a 20-mile gap where it passed through debatable territory. The Turkish line up to Khanaqin was on iron posts, the Persian on wooden poles of sorts; neither Turk nor Persian would agree to Persian or Turk filling the gap. Finally, a solution was arrived at and the line was built, supported alternately on a Persian wooden post and a Turkish iron one, and every one's honour was saved.

We had suffered on several occasions from thieves: our escort had three horses stolen on one occasion, and the Russian Commissioner had his full-dress uniform stolen on another. But the thieves at Qasr-i-Shirin earned our respect. They not only stole the collection of the Russian naturalist—much good might it do them—but they also collected the bedclothes from over and under one of my Indian surveyors, a portly gentleman, who woke up only in time to see his bed-clothes disappearing through the tent door.

The ruins at Qasr-i-Shirin, the great throne-room of the Sassanian kings, and the aqueduct, were well worth more time than we could spare, while a few miles further on we struck the ruins of a great wall running in a dead straight line across country, and said to be over 100 miles in length: doubtless the work of some previous frontier commission whose methods must have been even more leisurely than those of our Crimean predecessors. It was the middle of May before we got started, and though the weather was warming up, we were for the hills, and passing by the Zohab plain, we crossed the shoulder of Mount Bamu and the Shirwan river, known lower down as the Diyala.

We then moved to the slopes of the Avroman range, where a fortunate dispute as to the evacuation of a frontier post by the Turks rendered a prolonged halt necessary: but in what delightful surroundings! Gone were the desert and the heat. Snow still lingered on the range above us, while the narrow valleys in which we camped at a height of nearly 5000 feet were filled with walnut, mulberry and other fruit trees, through which flowed sparkling streams of icy cold water fresh from the springs for which this range is noted.

Only once did we dip down into the heat again, past the village of Gulambar, famous for its large spring, and another village, deserted by its inhabitants during the summer on account of a plague of snakes, though we saw none. We had now got well into Kurdistan, and our linguistic difficulties increased. In the south Persian or Arabic were spoken on either side of the frontier. In either language some of us were fairly proficient; but very few of our party knew Kurdish. We had therefore to rely to a great extent on the services of an old guide,

Ibrahim by name, over 80 years of age, whose claim to know every inch of the country was not far wrong. This may be attributed to the varied assortment of wives he had espoused during a chequered career; one from each tribe seemed to be the average.

I had invaluable assistance in the spelling of names from M. Minorsky, the Russian Commissioner, a Kurdish scholar, whose stout upholding of Russian interests was often mellowed by the presence of his charming wife, who accompanied the Commission from start to finish. While on the personal note I might mention that we were a very happy party. Mr. Wratislaw, our Commissioner, was beloved by all. Captain (now Sir Arnold) Wilson was full of energy, mental and physical; while Captain Pierpoint, our doctor, Captain Brooke in command of the escort, Captain Dyer, our transport officer, and Mr. Hubbard the Secretary, each in his own line contributed to the work, and to what is even of more importance on a lengthy International show, the general gaiety and cheeriness which so softens the asperities of frontier discussions. Our relations with our foreign colleagues were of the very best, most cordial throughout.

We had passed through some rugged country—the regular Kurdish hills—the nature of which may be gauged by the names of two of them, the English translations being the "breaker of nails" and the "tearer of pants."

A disaster occurred at Piran, a pretty spot near the northern end of the Avroman range, the Persian doctor losing his hand from a gun accident. Tenderly cared for by Captain Pierpoint, he soon rejoined and pluckily accompanied us for some time.

In the neighbourhood of Vazneh (lat. 36°) we handed over survey work to the Russians, who had carried their 1-inch = 2 versts surveys down to this neighbourhood. This survey, only requiring amplification on the Turkish side, was sufficient for delimitation along the great range which now formed the frontier. Our services were however always called on to supply maps where the frontier crossed valleys, in fact the difficult parts; the Qutur district, for instance—a place which has the honour of a whole paragraph to itself in the Berlin treaty. Although we had to leave it undemarcated we executed accurate maps of the whole area.

Mr. Wratislaw had here to leave us owing to ill health, to our lasting regret; Captain Wilson becoming Commissioner, and myself Deputy Commissioner in addition to my survey duties.

On July 24 we left Vazneh, and the following day entered the treeless tract which extends to Mount Ararat and renders the country somewhat monotonous. The higher hills were however magnificent, the mountain meadows like the "margs" of Kashmir being resplendent with wild flowers.

The fixing of a frontier was however repugnant to the finer feelings

of the Kurds, and from "evidence received" we were left in no doubt that most of our pillars survived their erection a bare twenty-four hours.

It is so easy to lay down a frontier in the chancelleries of Europe and to agree that if Turkey makes a concession in the south, Persia shall respond in the north; but this is no consolation to the inhabitants concerned: they will not stand it at any price, when they live in inaccessible country remote from central governments. Full consideration must always be given to local opinions. I remember an instance of this on the Afghan frontier, which had been settled and pillars built thirty years before. We were carrying out our new larger-scale survey, and a pillar was found 3 miles out of position, not on the watershed as it should have been. This led to great excitement in the Foreign Department. A re-survey was ordered, but still there was the pillar 3 miles out of position. On inquiry however the local inhabitants acknowledged that years ago some sahibs had come and put up the pillar on the watershed, "but," said they, laughing, "we soon altered that; our grazing grounds had been given to the Afghan village and their irrigation-water had been given to us, so we made an exchange, had our own little boundary commission, and re-erected the pillar where it now stands in its proper place." How the question was finally settled I cannot say.

A short stay at the small Persian town of Ushnu was much enlivened by the warm hospitality of the Russian stationed there, hospitality which was by no means dry. Returning to the frontier we were startled on August 2 by the news of the outbreak of war. It will be realized that from thenceforward our position was somewhat delicate. We however continued our work under the orders of our respective Governments, and after a short stay at Urmia, whither we had moved to be nearer the telegraph line, again returned to the frontier. Here we experienced a most unfortunate incident. While out shooting chikor in the hills in an apparently peaceful atmosphere we were suddenly attacked by Kurds, who fired at us heavily as we retired without dignity to our camp, being unarmed ourselves except for shot guns. How we escaped being hit has always been a surprise to me, but unluckily Mr. Hubbard, who was out for a walk and had separated from us, was shot in the leg, and had to our great regret to be invalided home.

A letter to Ismail Agha (the notorious Simko), the chief of the locality, brought him out next day with his band, and our would-be murderers were promptly seized and brought in, their only excuse being that they thought we were Russians! When Simko asked me whether he should hang the five men at once (more were seized later), I replied: "No; this is Persian territory and they must be properly tried." I am afraid his opinion of me fell. This cheery ruffian is still fighting, as he has been for the last ten years, Russians, Turks, or Persians, it does not seem to matter whom.

From now onwards, overshadowed as we felt by the Great War, there

was a decided slackening of interest in the work. Turks and Persians were very nearly abandoning the job, and the former several times received orders to do so, only to be cancelled by further contradictory orders. This had one good effect: every one worked with feverish haste to bring maps and boundary descriptions up to date.

In order to lessen the difficulties of transport and of getting out of the country at all, our escort marched back through Persia, the bulk of our party getting out through Constantinople by about the last train before the Turks came into the war. We could see Mount Ararat ahead —the goal of our hopes for the past year—and on its slopes and on the col joining it with lesser Ararat we placed our last pillars.

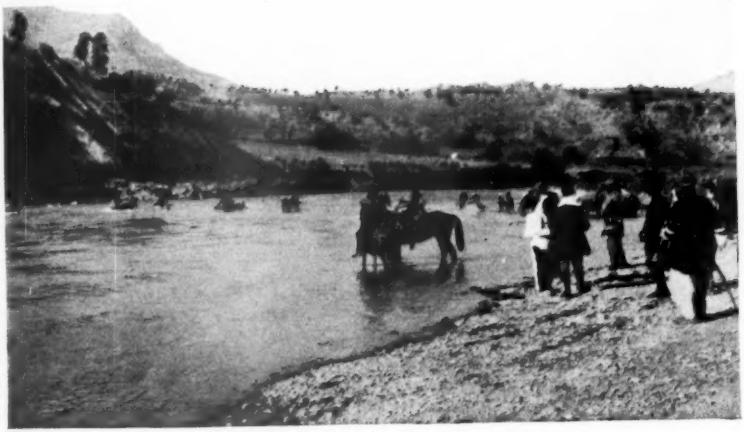
Saying good-bye to Turks and Persians twenty-four hours before the former came into the war, Wilson and I, the sole remnant of the British Commission, travelled by a somewhat roundabout route back to Mesopotamia and India—across Russia, out *viâ* Archangel, round the North Cape, down the Norwegian coast to England, and so by ordinary steamer to the East again.

As regards the technical survey work of the Commission, the greater part was undertaken by the British up to lat. 36° and by the Russians north of that point, the survey officers of the Turkish and Persian commissions having less experience; they none the less worked cordially with us and accepted our surveys without hesitation, a fact in great part due to the confidence inspired by our Indian surveyors, all Muhammadans.

As it would have been impossible for any system of rigorous triangulation to keep pace with the work of the Commission, the system adopted was as follows: Fao was connected in longitude with Bushire by telegraphic observations. Triangulation was carried up to Ahwaz, where observations were taken for latitude and azimuth, and a base measured with an Invar tape. Major Cowie then carried on a regular series of triangulation as far as Umm Chir, whence as far as the Tib river trigonometrical connection was maintained, partly by a regular series, partly by a short length of theodolite traverse.

From the Tib river the following methods were employed: From the advanced stations of the regular series points were fixed in the direction we were to march; when the Commission had marched to a suitable distance in advance of these fixed points, a base was measured, latitude and azimuth determined astronomically, and a small network of triangulation carried out. From stations of this network observations were made to the points already fixed in rear, permitting of the determination of the longitude of the network, and at the same time further advanced points were fixed and similarly used when the Commission had advanced beyond them. This process was repeated as often as necessary, the last occasion being at Urmia, after which the Russians assumed responsibility for further work, as they had already fixed many points by graphic triangulation on their large plane-tables. The closing difference

KURDS AND SURVEY KHALASSIS



COMMISSION CROSSING THE ZAB

KURDS

CAMP ON THE WAY TO HALEBJA

KURDISH VILLAGE WITH FLAT ROOFS

CARAVAN ON THE MARCH IN THE TAVILA DISTRICT

between our triangulation brought all the way up from the Gulf, and the Russian, was extraordinarily small.

It had been laid down in the protocol of November 1913 that the "Carte Identique" was to serve as a base for topographical work, but it soon proved insufficiently accurate for purposes of frontier demarcation. It was however decided for convenience that we should adopt the same scale as used on the old map, 1 inch = 1 geographical mile, or 1/73,050, and this scale was in general use up to lat. 36°, when the Russian scale 1 inch = 2 versts (1/84,000) was adopted.

The "Carte Identique" was accepted for (1) The Shatt al 'Arab. (2) The desert and march thence to Umm Chir. (3) Between the Tib river and to near Baksai, where the frontier simply followed the foot of the hill. (4) The Shirwan river. (5) The Avroman range. (6) The Little Zab river.

The country traversed was, except between Mandali and Qasr-i-Shirin, easy to survey; the difficulties we had to contend with were:

(1) The want of water in the south and the great heat, which resulted in haze and an abnormal amount of refraction.

(2) The tension in the north owing to the war and the general restlessness amongst the tribes, Arab, Persian, and Kurd, along the whole frontier.

(3) The rapidity with which the Commission worked; this however was in part our own fault, it being due to the rapidity with which we surveyed.

The results of the survey were embodied in 25 new maps and 10 sheets of the "Carte Identique"; each nation had two copies of each of these 35 maps.

The photographs reproduced are lent by Mr. Wratislaw and other officers of the Commission.

Before the paper the PRESIDENT said: The name of our lecturer to-night, Colonel Ryder, is one which is well known in geographical circles in more countries than one. As Surveyor-General in India, he may be said to have been the head of the geographical world in Asia, but it is not merely upon the official positions he has held that his reputation as a geographer rests. The work of exploration which many years ago he carried out in China and Tibet won for him the recognition of no less than three different geographical societies, for he holds the Gold Medal of the French Geographical Society, the Silver Medal of the Scottish Geographical Society, and last, but not least, the Patron's Gold Medal of our own Society. But it is not on China or on Tibet that he is to speak to-night. He is to give an account of the final demarcation of the boundary between Persia and Turkey. As a member of the Boundary Commission of 1913-14, he succeeded, along with his colleagues, in bringing to a close a very long chapter of boundary history, a chapter which had lasted certainly—if we date it from the Treaty of Erzerum when Great Britain and Russia first took a hand in the game—for three-quarters of a century; and, if we go back to the sporadic attempts made by Persia and Turkey themselves to demarcate their own frontier, a very great deal longer.

It speaks volumes, I think, for the ability and industry of Colonel Ryder and his colleagues that in the comparatively brief space of ten months they should have been able to demarcate nearly 1200 miles of boundary in difficult mountainous country; to have set up some 227 boundary pillars, and to have made a fresh survey of practically the whole of the country concerned. I have much pleasure in calling upon Colonel Ryder to give us his paper.

Colonel Ryder then read the paper printed above, and a discussion followed.

The PRESIDENT: You have heard a good deal about Sir Arnold Wilson: his capacity for crossing rivers, for seizing the best camping ground, and for coping with strange feasts. Perhaps you would like to see him.

Sir ARNOLD WILSON: In the first place, I should like to congratulate Colonel Ryder on a most interesting lecture; his genial personality, and that of Mr. Wratislaw, did more than anything else to make the Commission a success. We owed much, too, to the spade work in the Foreign Office from 1910 onwards of Mr. Alwyn Parker, and in Constantinople of Mr. Minorsky; and to the amazing efficiency both of the surveyors of the Government of India who were with us—mostly of Afghan descent—and of the Survey of India, which reproduced our maps and sent out copies as fast as we could make them.

Colonel Ryder is under the impression that nearly all the pillars have been destroyed. It was true that they were pulled down a few months after they had been put up, but as far north as latitude 36° they have all been re-erected, not once, but three times—practically every two years for the last six years. That indicates the value attached by the respective Governments to the maintenance of the frontier, and the importance attached by the local tribesman to the removal of the pillars. The frontier has thereby been permanently established, because everybody knows where the pillars were; the mere fact of pulling a pillar down and putting it up every two years fixes the frontier in a way nothing else could. We have heard Colonel Ryder say some rather hard things to-night about the Kurds and Arabs; I do not propose to attempt to-night to put forward a sympathetic or sentimental defence of these pastoral races in their respective haunts. Colonel Ryder was in the country for a year: I have been there almost continuously for seventeen years. From Lurs, Turks, Armenians, Assyrians, Persians, Kurds, and Arabs I have received much kindness and much friendship, and if on occasions I have received evil at their hands—well, human nature is in my experience much the same everywhere, and I remain, on the balance, much in their debt. Within the limits of his own code the nomad can be trusted, is a good friend, and a loyal servant.

As regards the dislike of frontiers by Kurds, they have a conception of frontiers which is different from ours, but is quite reasonable. According to them, sovereignty is not vested in land but in human beings. Freedom of movement according to the season, the weather, and the year is essential to nomads, who must find good grazing in order to live.

If a Turkish tribe occupies a valley, that valley becomes Turkish so long as they are there; if they occupy it to the exclusion of others, the valley itself becomes Turkish; if a Persian tribe occupies for certain periods the valley it becomes Persian for those periods. The point is not one of importance in their eyes, and they quite naturally consider that a boundary-line which affects to settle the territorial question irrespective of grazing rights and tribal custom is unreasonable and a probable source of strife, for in some year tribes on either side of the frontier must cross it to get the pasture.

Finally, I am tempted to tell you a story related of Nadir Shah by Kotzebue. Nadir Shah completed his conquests in India and the East and decided to turn his attention to his western boundaries which the Turks were troubling. He collected an army and proceeded to the frontier, where he saw a great stone on which was an inscription to the effect that whoever, be he Persian or Turkish, attempted to enlarge his dominions at the expense of the other side and pass that stone would be eternally damned. Nadir Shah was lost in thought for a moment, and recovering his self-possession, he ordered the stone to be uprooted, placed in a wagon, and carried before the army to the point which he designed as the limit of his conquests, where he set up the stone and returned in peace to his capital.

Mr. A. C. WRATISLAW (British Commissioner with Turco-Persian Boundary Commission): I should preface my remarks by begging you to remember that anything I say refers only to the first two-thirds of the Boundary Commission, as a little south of Quasr-i-Shirin my acquaintance with it terminated and passed into the more capable hands of Captain, now Sir Arnold, Wilson. I think Colonel Ryder did himself very much less than justice when he attributed the confidence shown by the Turks and Persians in the British Survey work to the fact that he had Indian Mussulmans serving under him. As a matter of fact, from the moment when the commissions joined one another at Mohammerah Colonel Ryder established an unchallenged supremacy over his foreign colleagues, whether Turks, Persians, or Russians; they ungrudgingly recognized him as their leader. This was, no doubt, partly due to his being senior in rank to all of them, and partly to his obviously greater experience and technical attainments; but, if he will allow me to say so, I think it was due in very great part to the tact and geniality which distinguished him and which enabled him to avoid every possible cause of friction. I do not remember a single instance even of divergence of opinion amongst the survey party from beginning to end.

I listened with a certain amount of grief to Colonel Ryder's irreverent and, I might almost say, impious remarks concerning the "Carte Identique." This magnificent work of art, which was a perfect picture of a map, was entrusted to me much in the same spirit as the early Victorian father presented a Bible to his son on going out into the world. The Constantinople Protocol which created the Boundary Commission in 1913 was based entirely on this Identical Map, and a considerable portion of the frontier was already laid down on it. At first my colleagues and I regarded the map with reverence bordering on idolatry. You may imagine the wave of alarm and despondency that passed over the camp when iconoclastic survey officers started to prove that the map was all incorrect. I believe it turned out to be fairly accurate in the northern regions, and I still like to believe that, considering the difficulties its authors were exposed to in the south, it did not reflect so much discredit on the surveyors of eighty years ago.

The provision of the Protocol of Constantinople whereby any point on which the Turks and Persians failed to come to an agreement should be left to Russian and English arbitrators to decide was a far-sighted and wise condition. It was based upon most unfortunate experience. But it had one rather curious result in that it prevented the Turks and Persians ever coming to an agreement at all except on unimportant matters. They almost invariably played for safety and agreed to differ, preferring that the decisions should be left to the arbitrators, rather than that they themselves should make mutual concessions that might not be approved by their Governments and

might get them into trouble. I suppose it is human nature to make use of a lightning conductor when it is provided. The result was that any decision of any importance was left to the arbitrators, and, as a matter of fact, the British and Russian Commissioners did not always see eye to eye on every point. However, we muddled through somehow and managed to give the necessary decisions. There was really very little to go upon in settling any of these questions. The ancient treaties between Turkey and Russia were all extremely vague and capable of various interpretations, of which you may be sure the Turks and Persians availed themselves. We could never get any reliable information from the inhabitants, when there were any, of the districts through which we passed. I remember on one occasion we captured a wandering shepherd, and asked, "To whom does the ground you stand on belong?" He said it was God's own country, which was not very helpful and not exactly true! The facts seem to be that there were immense tracts of debatable territory over which neither Power in the distant past had ever established permanent sovereignty; the inhabitants thereof were more or less independent and were quite ready to change their allegiance from one side to the other when circumstances rendered it desirable to do so. Further, the character of much of the territory was so vile that it was a matter for wonder that either Power should think it worth while to quarrel about it, while the inhabitants were hardly such as a self-respecting power would care to have as subjects. Colonel Ryder has already paid them a few compliments. I say nothing further than that for the most part, whether Arabs or Kurds, they seemed to me to be lazy, dishonest, insubordinate, and verminous ruffians. We did not meet with any of the cultured sheikhs of romance. What we arbitrators tried to do, as a rule, when we could not trace any frontier at all, was to make as equitable a compromise as we could between the conflicting claims.

The British Commission started with about 200 mules, 50 horses, and over 100 human beings; and to provide for the needs of all these while passing through a generally desert country and almost always far from a civilized centre; to arrange for their marches and for camping-grounds and provisions, and the passage of rivers, and for guides, etc., was really a very considerable task. But Captain Wilson took it all on his own shoulders, in addition to his by no means light work as British Deputy-Commissioner. The whole thing went without any hitch or delay from beginning to end. We always had enough food for ourselves and forage for our animals, and, in times of stress, we were able to come to the rescue of the foreign commissions which were less ably conducted. If Captain Wilson had one speciality more than another it was the crossing of rivers, and one of my pleasantest recollections is of Captain Wilson in a jacket and a red pair of bathing drawers showing by precept and example how to take mules and loads across a rapid river.

The British never had much trouble with the natives except in the matter of thefts, and I think that was due to the presence in our midst of an extremely efficient doctor. Whenever we halted for more than a day or two and the news was noised abroad, all the sick people of the neighbourhood, most of whom had never seen a medical man in the course of their miserable lives, came and placed themselves upon the panel, and you could see scores of them collected round Captain Pierpoint's tent waiting for their turn to be attended to. That created an atmosphere of general friendliness from which we all benefited.

There were a certain number of minor obstacles to complete comfort on the Commission to which I might refer. Fleas, of course, go without saying,

and there were tarantulas and large fat centipedes about three or four inches long with vermilion heads, the sudden appearance of one of which on the bridge-table drove the lecturer in panic flight from the tent. A Russian Survey Officer was either less quick off the mark or less lucky than Colonel Ryder, for he got bitten by one and was in terrible agony for many hours. There were also scorpions. Two or three scorpions are nothing to write home about, but I confess I was taken aback when they brought me a whole shovelful of these disagreeable creatures which had just been scraped off the site selected for my tent. It is on record that when Moses led the children of Israel through the Wilderness the people murmured against him. If the people ever murmured against Captain Wilson—I do not say they did—it was on account of the unearthly hour at which he made us turn out in the morning in order that the tents might go on ahead and be ready for us at the end of the march. I think we usually started at about 4.30 a.m. The never-ending marches, generally under a blazing sun, became very tiring after a bit to at least one elderly and not very robust person. When I was younger I used to think that there was something romantic and even enviable about the life of a tramp. I have changed my opinion since.

Brigadier-General Sir PERCY SYKES: I may perhaps add a word on one point to which but little reference has been made this evening. Not much has been heard of the Russian Commissioner, M. Minorsky, who is well known to the Royal Asiatic Society, and is one of the great authorities on Persian literature. I saw him last year, and he spoke enthusiastically of the friendly relations that existed between the British and Russian members of the Commission. I always knew it was a great deal owing to the character of the commissioners, but Sir Arnold Wilson has shed more light on the cause of the excellent relations that prevailed.

The PRESIDENT: I am sure you will wish me to convey to Colonel Ryder your gratitude for the paper which he has given us this evening. The hardships in those ten months, which in country such as he described to us must have been considerable, were largely disguised by Colonel Ryder by the device of interspersing his descriptions with amusing and interesting anecdotes. He told us, for example, of the interesting custom which some Arab tribes have of attaching the word "father" or "mother" to descriptive titles, such as the "Father of long noses" descriptive of the snipe, and the "Father of bellies" descriptive of a stout gentleman who had paid the village a visit. Some similar custom used to be, and probably still is, prevalent amongst the Turcomans who inhabit the country to the north of that described to-night. The practice amongst the Turcomans is to give to a child by way of name the first thing which they happen to see after the child's birth, and I remember coming across cases of Turcoman children who bore such strange names as "Very old woman," "Dust storm," and so on. That seems to be a somewhat similar custom to that of the Arab tribes on the Turco-Persian frontier.

Then Colonel Ryder referred to the characteristics of the Arab and Kurdish tribes, the chief of which appears to be theft, and that does not always go unpunished upon that particular frontier. It is almost twenty years since I was there, but I have to this day a most vivid recollection of being entertained by one of the Kurdish chiefs at a spot not far removed from Qasr-i-Shirin, and my genial host took me on to what corresponded to the village green and showed me an interesting little monument of brick and stone in the centre and asked me what I thought of it. As a monument I did not think very much of it, though I did not think it wise to say so. I asked what it repre-

sented, and I was told that it marked the grave of a man who had a few days before been caught and found guilty of stealing some of the chief's property. He had been walled up alive. That shows, at any rate, that theft does not always go unpunished upon that frontier, and perhaps, if such drastic punishment were meted out more often the character of the people might tend to improve, and theft become less.

I am sure we have all enjoyed Colonel Ryder's description of what undoubtedly is a historic event, the final demarcation of this difficult frontier between Turkey and Persia, which, as he reminded you in the course of his remarks, has troubled not only the Turks and Persians themselves, but the Governments of Great Britain and Russia for so long a term of years; and in thanking him for his paper this evening I would venture to add my own and your congratulations to him upon the success which has attended his labours.

TIME SIGNALS FOR SURVEYORS IN THE FIELD

Arthur R. Hinks, C.B.E., F.R.S., Secretary R.G.S.

The time signals sent from the French stations of Paris (Eiffel Tower), Lyon (Doua), and Bordeaux (Lafayette) are controlled by the Bureau international de l'Heure, established in the Paris Observatory under the direction of Monsieur Bigourdan, and supported by the International Union of Astronomy and Astrophysics, which contributes from its funds the sum of 50,000 *francs per year towards the expenses of the service.*

The following note was presented to the Time Commission of the International Union, meeting at Cambridge in July last.

THE surveyor in the field is deeply indebted to the astronomer for the present great advantage of precise time signals by wireless. But the needs of the geographical surveyor and the astronomer are different: and the present system of time signals, though doubtless perfectly adapted to the use of observatories, is not so well adapted to the use of the surveyor in the field. I therefore ask permission to present the following remarks to the Commission on Time.

2. In what follows I shall consider more particularly the needs of the surveyor in Africa working between latitudes about 30° N. and S. and longitudes 3^h E. to 1^h W. But much with obvious modifications will apply equally to surveyors in any part of the world, who now find themselves for the first time able to determine accurate longitudes, and who are modifying their field methods accordingly, making more use of absolute and independent geographical positions, and being content to abandon triangulation and traverse, when the topographical conditions are very unfavourable.

3. The surveyor in the field starts work very early and is usually away from camp or on the march soon after dawn. Until early afternoon he is on the move, and time signals sent in the early part of the day are not of much value to him. After resting in the afternoon he makes ready

for his astronomical observations in the first part of the night, and should finish not later than 23^h local time if he is to be ready for an early start on the morrow. The time signals which are of most value to him are those which he can receive between 18^h and 22^h local time.

4. The surveyor in the field, being thus limited in his observing hours, must economize his time and make a careful programme of star observations. It is important that he should know within a minute or two when he may expect the time signals, that they should be not unduly prolonged by superfluous preliminary matter, and that they should be complete in themselves, not useless unless certain figures are successfully received at later dates. Moreover, since the surveyor in the field is not usually a trained operator, and cannot be certain of reading the Morse code unless it is sent slowly, and he knows exactly what to expect, it is most important for him that the signals of any station should be immediately recognizable; that they should be sent absolutely to pattern, and at a standard speed. Lastly, it is essential to him that he should know, before he takes the field, what signals will be available; that no signals once established shall be discontinued or changed without ample notice; and that the widest publicity shall be given as far in advance as possible to the establishment of any new signal. For it must be remembered that the surveyor in the field is often out of contact with civilization, except by wireless, for many months at a time, and that notice of change transmitted in Morse code may not be understood by him. We must remember also that he works often in unfavourable local conditions; that the constants of his aerial or frame will differ more or less at each camp; and that he will often be using signals near the limit of audible reception.

5. Bearing all these conditions in mind, we may conclude that the desiderata of the surveyor in the field are as follows:

a. The tuning-in signals, whether V's or Calls, should be interspersed with the Call Signal of the station sending: otherwise the surveyor may tune-in upon the wrong station. It is desirable that the letters G.M.T., or G.S.T., should be introduced to define the kind of time sent; and it might be convenient also to introduce in the preliminary matter the code figures for the time of the final signal, if in mean time. The preliminary matter should not occupy more than two minutes; and it should begin punctually. If, as sometimes happens with the rhythmic signals in sidereal time, the transmission is delayed, the inexperienced surveyor, receiving nothing at the scheduled time, is likely to begin sweeping in wave length, and to be badly out of tune when the signals at last begin.

b. A signal of the International Type, but perhaps abbreviated, say by the omission of the first line, or even the first and second lines, is convenient for giving at once the approximate time, and to avoid confusion it is desirable that the dots should fall always on the tenth second.

c. The rhythmic signals should follow, and should be sent at absolute

times. This is by far the most important desideratum. A surveyor in the field cannot be certain of receiving the figures of first and last signals sent at some later time. He requires above all that any signal he does receive shall be certainly useful. Accuracy to hundredths of a second is of less importance than economy of time. Therefore he desires that the rhythmic signals shall be designed to begin and end at defined mean times, as near as may be obtained. He would not usually be interested in receiving some hours later corrections to the intended times. Corrections published later in bulletins could be taken into consideration when the field observations are being worked up in the computing office. But for the surveyor in the field the rhythmic signals should be considered as absolute.

d. If the usual transmission of times of beginning and end of signals of the previous day were still sent after the rhythmics for the day, for greater exactitude, the time of the surveyor, who would not want them, would be saved, and the time of the astronomer would not be wasted.

6. The signals most suitable for surveyors in the field would therefore be arranged something like this:

205600 V V V LY LY V V V LY LY . . . for say 90^{s}.
205730 G.M.T. de Paris 21 h.
205800 — · — · etc. — — —
205900 — — · — — · etc. — — —
210100 Rhythmics: say 306 beats in 300 seconds, of which the first at 210100, the 62nd at 210200, the 123rd at 210300, the 184th at 210400, the 245th at 210500 and the 306th at 210600 would be lengthened, but not joined to the next.

There would be a decided advantage in having the lengthened beats in this scheme at precise minutes, because it often happens that bad conditions or interference or accident hinder the reception of signals until the steady beat of the rhythmics is picked up: and the minute marks would then give simple time signals for direct comparisons.

I do not, of course, insist on these details; but it does seem to me that they have certain marked advantages for surveyors, and for general use would be quite as convenient as the system now in operation.

7. The European time-signals at present available in the evening for surveyors in the field in Africa are limited to the following:

20^{h} 0^{m} Bordeaux Rhythmics.
22^{h} 0^{m} Paris (Eiffel Tower) Rhythmics.
22^{h} 44^{m} Paris. Semi-automatic.
23^{h} 57^{m} Nauen. Automatic and Rhythmics.

And the last are too late for convenience, while the Eiffel Tower spark does not travel well.

There are thus no signals of the automatic type available at the time when the surveyor in the field requires them: that is, in the early

evening. The lavish signals of the morning are, as has been explained above, of little use to him.

At some future date it may be possible to arrange that, by co-operation between different nations, a time signal of high accuracy is available at every hour of the evening. For the moment I submit a more modest proposal, that new signals be established at G.M.T. 17^h and 20^h, or at 18^h and 21^h, of the type suitable for surveyors in the field, as suggested above.

In drawing up the above note for presentation at the meeting of the Commission on Time, the author had been careful to assume that the present service of Time Signals was all that the astronomers desired; but that they might be willing to meet as far as possible the needs of surveyors in the field. It soon appeared, however, that the astronomers were prepared for a thorough reform of the whole system, which by gradual accretion had become overloaded. The Astronomer Royal for Scotland, as President of the Committee, after careful consideration of the various proposals submitted, and discussion with General Ferrié and M. Bigourdan, prepared a scheme which was unanimously adopted in principle by the Commission, and referred to the Bureau for elaboration of detail. The old "Semi-automatic" signals sent twice daily by the Eiffel Tower and once by Lyon are to be abolished. The new form of rhythmic signals at absolute times, suggested above, was approved, and will follow the automatic signals of the International type, improved by the substitution of six dots for the three dashes at the end of each minute. These signals will be sent simultaneously by the Eiffel Tower on spark and by Bordeaux on continuous wave. They will be sent at intervals of twelve hours, but the hours are not yet decided: probably either at 08 and 20 or at 09 and 21. It is understood that there is some difficulty about the Eiffel Tower spark signals, which would interfere with Paris broadcasting at the hours most convenient to astronomers and surveyors.

This will provide one excellent signal in the evening for surveyors in Africa, and geographers will be grateful to the Commission for their readiness to hear the case of the surveyors, and to meet their needs in part. But we should keep steadily in view the ideal, to provide an accurate time signal every hour; and that these signals should not all have the same origin. There are at present disturbingly large and unexplained discordances in the determination of time—not large enough to seriously trouble surveyors in the field, but embarrassing to the astronomer and geodesist. The intercomparison of time by wireless has revealed their existence, and will doubtless eventually disclose also their origin. But for the present it is important to have independent services of time. The signals of the B.I.H. from the Paris Observatory, of

Nauen from Hamburg, and of Annapolis from the Naval Observatory at Washington, are all referred to the meridian of Greenwich; and Great Britain has been content to let others do what might have been thought peculiarly her own duty. The enthusiasm of General Ferrié and the existence of the Eiffel Tower were sufficient explanation of why the French took the lead in this matter twelve years ago, and why Paris was the natural home of the B.I.H. But other nations have since found it necessary to supplement the International service of time by individual contributions, and British prestige as well as British scientific work now demand that we should take an active part in the wireless time service of the world.

The moment is opportune, for British Imperial needs have demanded a chain of high-power stations based on the station now building at Rugby; while Mr. Short's invention of the free-pendulum clock must reduce to reasonable proportions the labour of providing a sure and steady service of accurate time, including the absolute rhythmic signals discussed above.

At Cambridge General Ferrié declared his readiness to provide new signals from the French station at Bamako in Nigeria, and perhaps also from Tananarive. They would be sent from clocks at these stations regulated by the Bordeaux signals of the B.I.H. They would be most valuable to the surveyor in Africa, and increase our debt to the French. But their establishment would not absolve the British from responsibility for a share in this matter commensurate with our Royal Observatory's dignity as the origin of the World's time and longitudes. We shall miss a great dramatic opportunity if the country does not insist that from the opening of the Imperial Wireless Service, Greenwich time signals shall be sent out from Rugby and re-transmitted throughout the Dominions, to our ships at sea and our geographers in the field.

SOUTHESK'S JOURNEY THROUGH THE WEST

WE are indebted to Mr. J. N. Wallace, Director of Levelling in Alberta, for a copy of his lecture with the above title, delivered to the Calgary Historical Society on 20 January 1925, and printed in the Calgary *Daily Herald*. There has been great difficulty in identifying the route taken by the Earl of Southesk in his journey of 1859. He himself, in a letter to this *Journal* (May 1899, 13, 546) following some remarks in a discussion on Prof. Collie's paper (*G. J.*, April 1899, 13, 337), was unable to throw any light on the question, beyond the belief that he passed close to Jonas Pass, which proves to be quite wrong. The country was quite unmapped in 1859, and very imperfectly now.

Lord Southesk published the account of his journey—'Saskatchewan and the Rocky Mountains'—in a small edition, never reprinted. Between

1857 and 1880 there are only three published narratives of such journeys: by Palliser, Milton and Cheadle, and Southesk. Mr. Wallace, with the help of members of the Forestry Service and the Geological Survey, has succeeded in identifying several of the mountains described by Lord Southesk, and has thus worked out the route, of which we have now for the first time any satisfactory account.

In his covering letter Mr. Wallace says: "I am sorry the form in which the address is sent is so crude [newspaper cuttings nicely mounted and bound]. Our Historical Society has only just celebrated its second birthday, and having received no legacy, is about as short of funds as the average person of that age. It is therefore unable to print its papers. However I hope that the Royal Geographical Society will accept the article as a tribute to one of its former Fellows for whom, both for his literary abilities and for his honourable views of life, I have a high regard."

In reprinting a considerable portion of the lecture, we take the opportunity of tendering, with our thanks to the author, our best wishes to the youthful Historical Society, in its large and fruitful field of work.

Late in July 1859 they left Carlton and travelled by the usual route, on the north side of North Saskatchewan river, to Fort Pitt. After a couple of days spent there they crossed the river to the south, and proceeded to Edmonton. The route ran westerly for some 70 miles, then north-westerly, passing round near the modern Whitford lake in Township 56, Range 16, and then south-westerly until opposite Edmonton. "The men advanced to the edge of the high bank and saluted the fort with a general volley, which was promptly answered by the dispatch of a boat to take us across," where Mr. Brazeau, temporarily in charge, gave them the usual welcome they had received at every post.

After a week in Edmonton, Southesk resumed his journey to the west, the party now increased by the addition of a guide called Antoine. His intention was to proceed to Jasper House, but, shortly before reaching Lake St. Ann, they met Mr. Moberly, of the Company's service, travelling from his post at Jasper House. This was H. J. Moberly, brother of Walter, the well-known railway engineer. He had joined the Company in 1853, and in the intervening six years had travelled extensively through the west. Moberly, in some reminiscences published in *The Beaver*, mentions that he had been told by headquarters when coming west that spring to notify any post he passed to be ready to assist Southesk, but, strangely enough, he does not refer to this meeting. Some remark on the expedition, as it appeared to him on this occasion, would have been very interesting, but from the programme he suggested to Southesk, he must have considered that the party was well organized. He said they would only waste their time by going to Jasper, as there was no game there, and the post itself was on very short rations. He advised Southesk to leave the trail when he reached McLeod river, and to go southerly to the upper waters of the Saskatchewan, and said he would then have a country which it would take at least ten days' travelling to cross, which Moberly believed no white man had ever seen. One half-breed hunter, he said, might have been there long ago, but he doubted it, and bear and sheep should be abundant. If, however, Southesk did go that way he could

not get back to Carlton by October as he had intended. "Be it so," said Southesk.

After leaving Moberly the party continued westerly, much troubled by the muskegs and fallen timber. He well describes the trail as a boggy ditch, out of which the pack-horses were for ever trying to escape into the trees on either side. Southesk's remarks about the horses all through his journey are very entertaining. Each had its own peculiar character, and their amusing and exasperating ways are well described, and will be recognized by every one who has had to deal with Western ponies employed on such work. Each pony

Lord Southesk's Route, as worked out by Mr. J. N. Wallace.

has his name in the index of the book, and almost as many references as each of the men.

On reaching McLeod river they turned off south-westerly and then southerly, and followed up Embarras river. Southesk shortly obtained his first view of the Rocky Mountains, and was much impressed. "A glorious sight, stretching along the horizon as far as the eye could reach. Below us rolled the river among dark pines, hills then for many miles, then the foothills of the loftier range, and then uprose the mountains themselves, rugged and peaked and scored with gashes; not magnified hills, but rocks in very arche-

type, steeped in a soft mellow gray against the blue sky, with masses of snow glittering in the sunlight."

For several days they travelled up Embarras river, crossing and re-crossing it as many as thirty-seven times in one day. They then left the river and struck off to the south-west across low timbered hills, and came again to the McLeod. Southesk is here entering on the stretch of country referred to by Moberly as practically unknown, and Moberly knew all the history of the district. Certainly there has been the utmost difficulty, when preparing this account, in identifying the route taken, not only because there was no way for Southesk to describe it by referring to names or a map, for there were no names and no map in his time, but there is but little shown on any published map even at the present day. It has been necessary to have recourse to the few people who have travelled the area and, as stated already, first of all to make an elaborate study of the scattered remarks in Southesk's book.

In the northern part of this journey, through the then unknown, great assistance has been given by Mr. Morse, in charge of the Alberta division of the forestry service, and by Mr. Hutchison and Mr. Mackenzie of the same service, all of whom have travelled in that area and have been able to identify many features from the descriptions in Southesk's book. Further assistance has been supplied by the Geological Survey, which had a party in charge of Mr. W. H. Miller surveying in that area last summer. Mr. Miller has identified several peaks and supplied photographs, and has given their exact position and altitude, the first time they have been recorded, although it is now sixty-five years since Southesk described their existence.

It may be said that if a reader had to rely only on a careful perusal of Southesk's book, and such maps as have been published, he would be quite at sea as to where Southesk travelled, yet it is a remarkable thing that, when the disconnected accounts in the book were assembled and placed before Mr. Mackenzie, who at present lives in that district, he said Southesk's accounts were so vividly descriptive that there could be no doubt about the route taken. It is this need of local information to supply what is wanting on existing maps which is undoubtedly the reason for Southesk's journey having received so little notice, even by some of those who have travelled there since his time. A large proportion even of the few who have read the books have probably not had the least idea of what they were reading, so far as the route is concerned.

The place where Southesk left the Embarras to go over the hills to the McLeod is near the present Coalspur station, and the place where he again reached the McLeod is near Shaw station. He then travelled up McLeod river for some days. On September 1, he writes that one of the mountains particularly struck him, owing to its resemblance, on a greatly magnified scale, to Arthur's Seat, near Edinburgh. Mr. Mackenzie states that a sketch of Arthur's Seat, with which he was supplied, is so very like a mountain on the east side of the river, opposite Cadomin station, that there can be no doubt about identity, although there is not a map published which shows any mountain there.

Southesk continued up the McLeod, past this mountain, until he came to a tributary flowing into the McLeod in a series of cascades. This stream has been identified by these cascades as the modern Whitehorse river, which joins the McLeod in the west of Township 46, Range 23. Here the party left the McLeod and followed up the stream of the cascades to its source a little

beyond the present railway terminus at Mountain Park. On the way, Southesk camped in a glen, "the end of which was crowned by a grand peak." This peak is now called Mount Cheviot.

They passed over a low divide and then descended into the valley of a large stream flowing to the north-west, which Antoine called Medicine Tent river, but the modern name is Rocky river. Either Antoine, who was only trusting to hearsay, made a mistake and confused this river with one which flows parallel, about 10 miles to the south-west, on which Medicine lake occurs, and which is now called Maligne river, or else whoever named Medicine lake has confused the two streams. This seems the only way to account for the strange fact that the typically Indian name Medicine occurs on two paralle and independent rivers flowing near each other.

Only one stream is shown on both Southesk's map and Palliser's map, a fact which gave H. F. Macleod, one of the C.P.R. engineers, a wild-goose chase in 1875, for he worked up Maligne river from Jasper on the supposition that it was Southesk's Medicine Tent river, until he was forced to the conclusion that Southesk had never been in that valley.

When on the low divide south of the modern Mountain Park railway station, Southesk describes a magnificent snow-crowned mountain standing on the opposite side of Rocky river, and he gives a sketch of this mountain. Mr. Miller states that this is undoubtedly a mountain which he has marked on two of his photographs, the altitude of which he has ascertained to be 10,270 feet. His position would correspond to Section 5, Township 44, Range 23, although of course no township lines will ever be run there. On the same day, while descending into the valley of Rocky river, Southesk made another sketch of "a noble mountain of black slaty rock, the last on the right as we descended the hill, with a curious cloven summit. This wild and beautiful mountain I have named Mount Lindsay after my friend Sir Coutts Lindsay, of Balcarres." Mr. Miller has also identified this mountain. Its position would be Section 10, Township 45, Range 24, and its altitude is 9220 feet.

Considering that Southesk was travelling through country unknown in his time, his modesty in naming features was remarkable, and in strong contrast to others passing through the country, some of whom, following more than thirty years later, have named many features without any reference to the fact that Southesk was ever there. People who give names should first have studied the history of the district. In his journey across the West, Southesk named only three features, all of which are mountains in this area, and it is quite evident that, even in these few cases, he abstained from selecting the highest peaks.

. . . . . .

After reaching the valley of Rocky river they travelled up that stream "through scenery of surpassing magnificence. On the easterly side the heights are less grand, but on the west is a far higher wall of rock broken by a succession of glorious peaks, while deep rocky glens run outwards to the river. The mountains differ in form, but all agree in one thing; they are rock, absolute rock, the strata sometimes piled like gigantic slates, sometimes so whirled that they seem like vast petrified trees upheaved in the ruin of a former world."

They camped close to the source of Rocky river. The height of land here is probably about 6500 feet. Next day Southesk climbed to the summit of an isolated mountain, excessively steep and with much loose shingle. "Before quitting we piled up big stones and built a sort of tower or cairn, some 6 feet

high, as a memorial of our visit. The Athabaska head stream (he means Rocky river) rises in the snows of a great mountain shown in my sketch. I am the first European who has visited this valley, and if I might have the geographical honour of giving my name to some spot of earth, I should choose this mountain near which the two rivers rise." He surmises that, being so high, it is probably already named by some one who had seen it from the western side, a surmise which was unfounded, and he restricts himself to the smaller eminence on which he had placed his cairn.

This great mountain is shown in one of Mr. Miller's photographs but, as it is just outside the limits of his survey, he did not record its exact position or height, and it cannot yet be shown exactly on any map. It is about 5 miles south-west of Southesk's cairn. It is to be hoped that when it receives a name Southesk's wishes will be respected. As his name is now well established on the smaller mountain with the cairn, the great mountain might well be named Mount Kinnaird. Mr. Miller states Southesk's cairn is 8330 feet above sea. When he climbed the mountain last summer, the first person to do so since Southesk was there in 1859, he found a small cairn on the summit.

Several days were now spent in hunting, and then they moved south-easterly down the stream which flows in that direction, and camped about in the modern Township 43, Range 21 (not yet surveyed, of course), opposite a magnificent mountain resembling the bastion of some giant's castle. A sketch of this mountain forms the frontispiece of Sonthesk's book, its outline somewhat like that of Crow's Nest mountain in Southern Alberta. "To this grand rocky mass I have given the name of Mount Dalhousie in memory of a much-lamented friend, the eleventh earl of that title, more extensively known as Lord Panmure, at whose house my journey to America was first suggested."

This remark shows that the mountain is not, as might be supposed, named after the Dalhousie who was governor-in-chief of the eastern provinces in the early days, and whose name is attached to the well-known university. He was the ninth earl, and, previous to being governor, had been one of Wellington's great generals. His son, the tenth earl, was a famous Governor-general of India. The Canadian governor had a younger brother who was created Baron Panmure, and his son, after whom the mountain is named, was the well-known secretary for war during the later years of the Crimean War. Late in his life, his elder first cousin, the Governor of India, dying without a son, the title passed to Panmure, who thus became the eleventh Earl Dalhousie, the two titles having previously been independent. This explains Southesk's remark "more extensively known as Lord Panmure." The university in far eastern Nova Scotia and the mountain in Western Alberta are therefore named after an uncle and nephew. The Dalhousie after whom the mountain is named died in 1874, the year before the book was published, but many years after the journey.

This mountain has not yet been satisfactorily identified owing to the unsurveyed condition of the area. There is a very high mountain in the location described by Southesk, which corresponds to the north part of Township 42, Range 21, but, judging from a small photograph, it does not appear to be the mountain shown in Southesk's sketch, and in both the other cases he abstained from naming the highest peak in the area, although he gives a sketch and a description of the highest peak, both so good as to have fully justified his selecting them for the names. We have now met with the only three names which Southesk applied in his whole journey.

The march was continued a short distance further down the river, and

then they left it and went up what Southesk calls one of its two southerly tributaries, but which was really the main Brazeau; and they probably reached this river by striking off south-easterly about across the north-west of Township 42, Range 20. After proceeding a short distance up this new river, their so-called guide, who really was quite ignorant of the country, said they could not find a way out that way, and they all marched back again downstream for a considerable distance below where they had crossed it. Then the guide halted as though in doubt, and Southesk states he had suspected for some time a general intention to leave the mountains by the easiest way, not, as he wanted, by the finer less-travelled routes. "I was very angry, things having been done this day without consulting me, and instantly turned my horse and rode back alone to where we had crossed the river, which I found with difficulty, there being no regular trail, and after a time the rest came up." Southesk showed considerable firmness and courage on this occasion, for it is always difficult to deal with a guide in a country unknown to oneself.

After continuing up the main Brazeau they left it, and went up a tributary now called Job creek. On reaching the headwaters of this stream they missed turning off, as they should have done, at a small creek which led to the actual pass, and were faced by a chaos of rocks about the size of a cart through which they got the horses with the utmost difficulty. Then they had to drag them with ropes up an almost perpendicular wall of frozen snow, 20 feet high, cutting out steps. Southesk describes the whole as an almost incredible feat carried out by McKay. To their joy they found a stream on the other side, evidently flowing toward the Saskatchewan. Down this stream, now called Coral creek, they travelled, and finally reached Kootenay plain.

Both Job creek and Coral creek were named by Prof. A. P. Coleman, who in 1892 followed the route of these streams, thirty-three years after Southesk. The former name, he states, he gave after an Indian, and the latter on account of the fossil corals. He makes no reference whatever to Southesk having been in the country, a marked example of the general want of recognition of this journey, for when it comes to giving names certainly Southesk's party should have been considered.

Southesk makes no mention of leaving the Brazeau, evidently thinking he was continuing on the main stream, and his very imperfect sketch-map shows the long approach to Kootenay plain as down a river flowing due east, which indicate a possibility of his having gone up the Brazeau to Cataract pass and come down the modern Cline river, but his account, after he crosses the pass, states that they travelled ever to the south-east. Additional evidence has, however, been supplied by Mr. J. B. Alexander, D.L.S., of the Topographical Survey. Southesk states that the river they came down was bounded on the east by a wall of perpendicular mountains and discharged finally through a deep canyon. Both of these features Mr. Alexander has identified as belonging to Coral creek.

They crossed Saskatchewan river on a raft and travelled upstream a good many miles looking for a route to reach Bow river, but, finding they were being led in the wrong direction, marched back again to near their old camp at Kootenay plain. Next day they found the proper trail, an excellent one. No names of features are mentioned until Southesk reaches Bow river, but by various processes of elimination the conclusion is that he went up Siffleur river and crossed Pipestone pass, which latter has been well surveyed and is at an elevation of 8036 feet. The pass was crossed on September 21 in a snow-

storm, "leaving just enough visible to show how much noble scenery was being lost to me for ever. For ever! that is too strong a word. Who can tell what powers of travel the spirit may have after death?"

They were now on very short rations, having nothing but dried sheep-meat, pemmican, and tea; but Southesk was loath to lose his last chance of a goat as he had got none. "These goats seem to lure men to destruction, and they mock at their misery. Once I had nearly broken my neck, twice nearly burst a blood-vessel, but all in vain." Finally he got two, after a hard and dangerous climb, both of them falling over 20 feet of rock and breaking their horns; but he was glad to get them on any terms.

They then travelled to Bow river and down that river. When near the modern Castle station a record was found on a tree showing that Hector, of the Palliser expedition, had passed there a month previously, on his way from Kicking Horse pass, when he came down Bow river and, after meeting some Indians, turned round and went back, and then over Pipestone pass to Kootenay plain and down the river to Edmonton. Neither of these travellers had known that the other was in the country, but Southesk had previously stated, when coming up the Pipestone pass, that he saw traces of recent travellers.

On September 30 Old Bow Fort was reached, all glad to be out of the mountains. "I entered the mountains with joy on September 1, and leave them with greater joy on October 1." In explanation he states that, grand as the scenery was, he had expected the peaks would have been higher above the valleys, not having anticipated the elevation of the valleys themselves. He was also disappointed in the sport, as, although he got many sheep, he had seen only one bear, and obtained only two goats.

Having now seen Southesk safely out of the mountains, we may leave him to pursue his homeward trip with less attention. His handy men made three complete carts and harness out of the remains of discarded outfit of Palliser found at Old Bow Fort, and they set out for Edmonton by the old trail north-easterly across to Olds, and then north to Edmonton. From here he went by scow down the river, but was frozen in at Victoria, and they had to send a messenger forward to Fort Pitt for horses. These having arrived they travelled to Carlton, and from there by regular winter trails to Touchwood, where they arrived on November 28. Southesk states he was hospitably received by Mr. Taylor, and derived great pleasure from three newspapers, giving the news up to June 30. Mr. Taylor told him a rumour had come down that his whole party had been killed by Blackfeet, which Southesk feared might have reached his home.

From Touchwood they went to Fort Pelly, then to Swan lake and Lake Winnipegosis, and down that lake and Lake Manitoba, finally reaching White Horse plain and Fort Garry on January 8. Here he said farewell to his men, "who had been so cheery in prosperity and so gallant in adversity, and I shall ever feel under debt of gratitude to these faithful companions."

From Fort Garry he made his way to St. Paul and New York, and finally home, and "right glad was I to reach my native land, after so long an absence and such distant wanderings."

THE DE FILIPPI EXPEDITION TO THE HIMALAYA

Storia della Spedizione Scientifica Italiana nel Himàlaia Caracorùm e Turchestàn Cinese (1913–1914).— F. de Filippi. Bologna: Nicola Zanichelli. [1924.] 10½ × 8, pp. xiii. + 541. *Illustrations* (2 *coloured*, 29 *full-page*, 288 *in text*), 9 *Panoramas and* 3 *Maps in pocket.* *Lire* 200.

THE discovery in 1909 of the unsuspected extent of the Siachen glacier system served to draw attention to our lack of any precise knowledge concerning the adjacent basin of the Rimu, as also of the sources of the Yarkand river, and of the mutual relations of both with the still more mysterious valley of the Oprang, into which only Younghusband had forced a difficult entry. It was to the solution of these several problems that our Gold Medallist, the author of the present volume, addressed himself in 1913. Had it not been for the outbreak of the Great War there can be little doubt, amongst those who know his record, that his success would have been as complete as that which has invariably attended the remarkable series of recent Italian expeditions in which he has played so prominent a part. His solution of the first two of these problems is complete and final; but though the outer confines of the Oprang have been accurately laid down—a very great safeguard to its future explorers—the expedition had to go home before the main valley itself could be explored.

The Italian expedition of 1913–1914 seems to the reviewer to open out almost a new chapter in the history of mountain exploration. De Filippi set himself not merely the problem of exploring, as only a mountaineer could do, these unknown glaciers and baffling mazes of mountains, but also the vast task of making a complete survey in all the sciences of the whole extent of country to be traversed. Investigations in ethnology, meteorology, geology, terrestrial magnetism, gravity, indeed all the problems of physical geography in its widest sense, were regarded as equally principal objects of an exploring expedition. Surely no expedition has ever entered High Asia, or any other mountain region, with such an equipment of scientific instruments, or with such a band of skilled observers. The names of Alessio, Abetti, Dainelli, Alessandri, and Antilli, with Ginori, Spranger, and Wood with his Indian Survey party, including Jamna Prasad and Shib Lal, and last but not least the veteran guide Petigax, are a sufficient indication of the quality of the work done. Their scientific results are being published in the beautiful series of 'Relazioni Scientifiche della Spedizione Italiana de Filippi nell' Himalaia, Caracoram e Turchestan Cinese (1913–1914)' by Zanichelli of Bologna, and their extent and importance can in no way be realized by a perusal of the narrative of the expedition now before us, which is intended mainly for the general reader.* But the general reader has never had a travel book better got up nor so lavishly illustrated, and it is a volume which will be found of engrossing interest by every one concerned with any aspect of Himalayan problems. Even through the earlier chapters, which deal with comparatively well-known ground, the author succeeds in holding our attention. He has the rare faculty of effacing himself and giving us instead the personality of the place he is describing. In Srinagar our time is spent with Mogul Emperors rather than with the men and means employed to organize victory for the expedition by such care and forethought in preparation as can only be appreciated by those who have travelled under similar conditions of season and country. Even

* The glaciological volume was reviewed in the *Journal*, vol. 63, p. 243. Two volumes on the peoples of the tract explored have also appeared.

apart from the exceptionally fine illustrations, the chapters on Baltistan and Ladak are of unusual interest, for, in order to place their various researches on a sound basis, the expedition wintered there, and this first account of winter conditions adds much to our understanding of the conditions of the life and occupations of the inhabitants. The remarkable mixture of Moslem and Buddhist elements, in the past as in the present history of Baltistan and Ladak, is well brought out. The photographs of Buddhist architecture, painting, and sculpture in chapter vi. are especially noteworthy. Desideri gave us the first account of Leh, and now two centuries later his compatriots give us a description such as has not been excelled in the mean time.

Chapters v., viii., and ix., contributed by Professor Dainelli, describe summer and winter conditions over the greater part of Baltistan and Ladak, from Skardu and Shigar to the Tso Moriri and Pangong, with their patchwork pattern of intermingled population ranging from so-called Dards to pure Tibetans.

We are introduced to the rigorous pleasures of caravan travelling by the frontispiece, a very beautiful and absolutely true painting of the view looking back down the upper Shayok. There the travellers entered uninhabited country and saw no cultivation for the next five months. It is in fact a region entirely destitute of supplies: even the scanty grazing of the side glens is left behind before reaching the lofty plateau of Depsang, where *argol* must replace the last woody roots of *burtse* as fuel, and which was destined to be for several bleak weeks the headquarters of the expedition, at a height of nearly 18,000 feet above sea-level. Mountaineers will examine with interest the plate opposite p. 312 showing the uncompromising eastern side of the 25,000-foot range between the Shayok and the Nubra, and will conclude to follow previous attempts from the west.

The actual exploration of new ground commenced on reaching the Rimu glacier. The author's spelling of this name of doubtful origin might well be universally adopted, for it exactly reproduces the sound of the vernaculars, while Remo does not. It is interesting to note in the illustrations a development of ice-pinnacles comparable to that found on the north side of Mount Everest, indicating that the respective climatic conditions approach each other much more nearly here than on the southern and western aspects of the Karakoram or Muztagh ranges. It will be noted that the snouts of all the great Karakoram glaciers terminate successively at a higher and higher altitude as we proceed from west to east: this is probably due rather to increased evaporation than to decreased precipitation.

By an admirable division of forces the whole of this great glacier system was explored and surveyed—for the first time and with final thoroughness. The value of the text illustrations and panoramas is greatly enhanced by a map on the scale of 1/100,000, which, with two other maps and the panoramas, is conveniently placed loose in a portfolio at the end of the volume.

The Rimu glacier was proved to be the one true source of the Shayok river —as had been suspected; but it remained for the Italians and their English colleague to make the totally unexpected discovery that the Yarkand river itself takes its ultimate source from the same glacier. The north-western arm of the Rimu glacier, shortly before its junction with the main ice stream, abuts against the water-parting and thrusts an elbow actually over the main axis of the Karakoram, towards the north-east; from this overlapping tongue the Yarkand river rises. Thus the waters flowing to such diverse destinations as the Indian Ocean and the dead salt beds of Lop Nor are separated only by an

almost invisible rise on a level glacier surface. Wood and Spranger, working up the Yarkand river from the north, first found this overflow from the ice-reservoirs of the Rimu (as described by Spranger in chapter xiii.), and three days later De Filippi, leading a party up the Rimu glacier itself, reached the same spot from the south. There is strong evidence, amounting to a practical certainty, that the head source of the Oprang river itself lies only 5 miles to the north-west of this spot, that is 30 miles further to the east than was hypothetically shown on the old map.

The previously recorded evidence concerning the lost routes from the Yarkand river to Baltistan and Nubra is carefully set out. All the way through the book the author displays a very complete knowledge and a just appreciation of the work of previous travellers, thereby giving an added interest to his own narrative. He manages to give criticism in the form of impersonal additions to our knowledge rather than in the key of personal correction, a method which might well be, but is not, adopted by all travellers. He even goes to the length of quoting in full from our *Journal* a mere forecast of the topography (*Geog. Journ.*, 35, pp. 652-3), confirming it in a generous sentence. How different is such a chivalrous spirit from that animating the other type of explorer, who may ultimately find himself remembered as much because of the way he belittles his predecessors as on account of the good work he may have accomplished himself!

Wood and Spranger, whilst working out the different headstreams of the Yarkand river, found indubitable traces of native travellers, and there can be no doubt that, in addition to Younghusband's Aghil pass, other routes were formerly in occasional use which led from above Khapalun (= Khufelang of English maps) on the Yarkand river, over into the head of the Oprang valley and thence across the lofty main axis of the Karakoram chain on to the upper Siachen glacier: here the routes would again divide, one leading directly down this glacier to Nubra and Ladak and the other over a side pass into the Saltoro valley, and so to Khapalu in Baltistan. This is the most intriguing Himalayan secret that remains to be worked out—though we must not be surprised to learn that it has been solved this year by Visser and his intrepid wife, who are credited with the intention of entering the Oprang valley from the Hunza side. English readers may like to consult Wood's most interesting report to the Survey of India.*

On August 16 the party, temporarily united again at their base camp on the Depsang plateau, received the first news of the outbreak of the Great War. The Italian officers, Alessio, Antilli, and Alessandri, decided to return home immediately, and in twenty-three days they were in Bombay!—a pretty good travelling record. Wood being enabled by his orders to remain, replaced Alessio as second in command. The author records his appreciation of the action of the Indian authorities in allowing Wood to remain and in permitting the continuation of the radio time-signals from Lahore and the complementary meteorological observations at Dehra Dun, despite the grave preoccupations of this crisis. It is an indication of the great physical difficulties surmounted by the expedition that they did not learn definitely that England was at war until they reached Yarkand in October. This catastrophe, though it ultimately shattered the original scheme of the expedition, was not allowed to divert them

* 'Explorations in the Eastern Karakoram and the Upper Yarkand Valley. Narrative report of the Survey of India Detachment with the De Filippi Expedition, 1914.' Dehra Dun: printed at the Office of the Trigonometrical Survey of India. 1922. 6*s*.

from anything that was still possible. The only practicable way, for such a large party with such heavy impedimenta, to work beyond the Karakoram pass was to enlist Kirghiz camel transport from Shahidula. Their caravan-bashi Ghulam Rasul, none other than our old friend the author of that delightful book 'A Servant of Sahibs,' carried out the delicate operation of changing transport in the middle of a desert, and the expedition crossed the Karakoram pass and the Sughet Dawan. At Sughet a gravity station was established and most of the heavy impedimenta were temporarily deposited, while the expedition split up for work in different directions and Dainelli and Marinelli left for Italy *vid* Kashgar. It was only through a very carefully devised scheme of division of forces that such an enormous amount of work was accomplished in one season, interrupted as it was by prolonged spells of bad weather: we read constantly of clouds interfering with work and of a snowstorm lasting seventy-two hours. During September De Filippi, with Ginori and Abetti, followed the Yarkand river to below Bazar Dara in an attempt to penetrate to the Oprang Valley by the Aghil pass; but heavy rains rendered the Raskam river impassable, and they had to return disappointed, crossing the rarely used Takta-Koram pass to Khargalik. Here their survey of 5000 square miles was closed and another gravity station established; indeed, pendulum observations were carried out at suitable stations right through to the Russian Observatory at Tashkent, where all the heavy apparatus still lies. A return to Europe was now inevitable, and, passing through Yarkand and Kashgar, the last of the party, having crossed the Terek Dawan in the snows of November, reached the railway at Andijan. From Tashkent they slowly made their way, through the dislocation of the war, to Odessa and through the Balkans to Italy.

With an uncommon economy of words, yet with no apparent effort of compression, the author—aided by his collaborators with pen and camera—succeeds in giving in short compass a delightful account of a very long journey, during which he never allows his readers' interest to flag for a single page, for he never fails to bring reality before them. It is much to be desired that a translation of this remarkable book should be available for English readers.

T. G. L.

IMPERIAL STOCKTAKING

The British Empire. A Survey in Twelve Volumes. General Editor, **Hugh Gunn.** London: W. Collins Sons & Co., Ltd. 1924. 9 × 6. *16s. net each volume.*

(2) The Story of the Empire. Sir Charles Lucas. (4) The Resources of the Empire and Their Development. Evans Lewin. (6) The Press and Communications of the Empire. J. Saxon Mills. (8) Makers of the Empire. Hugh Gunn. (9) The Native Races of the Empire. Sir Godfrey Lagden.*

THE series to which these five volumes belong was published as a part of the educational work of the British Empire Exhibition, and was planned to give "a complete survey of the history, resources, and activities of the Empire looked at as a whole." The editors have been fortunate in securing the assistance of many persons prominent in the public life and administration of the Empire possessing a personal knowledge of the subjects of which they write, so that the series, although prepared primarily for the general reader, has also a special historical value and authority on this account.

* For review of this volume see *Journal*, 65, p. 455.

Sir Charles Lucas' volume, 'The Story of the Empire,' is an historical sketch, arranged chronologically to bring out, step by step, the expansion of the island kingdom into a world-wide empire. It is a simple, concise, and clear narrative, admirably suited to its purpose.

The editor's volume, 'Makers of the Empire,' is a co-operative undertaking, and is intended to add the colour and romance of individual enterprise to the judicial narrative of Sir Charles Lucas. To this volume Mr. Evans Lewin contributes chapters on the Chartered Companies and Pioneers of Africa, Professor Berriedale Keith on Makers of the Constitution of the Empire, Mr. Stannard on Pioneers of America and the East, Mr. Garnsey on Pioneers of Australia and New Zealand, Commander Darling on Sea Venturers of Britain, and the Editor himself on Pioneers of Canada and Missionaries and the Empire. The ground covered in this volume is too extensive and too miscellaneous to admit of useful comment. Commander Darling, by confining himself chiefly to the exploits of three of our more famous sailors, Drake, Anson, and Cook, finds scope to write interestingly of them. But the small space allowed to the chartered companies and missionaries leaves their story really untold. Several old maps of great interest are reproduced, and the Editor has constructed one showing the place of birth or origin of some sixty-six leading pioneers. From this it would seem that the London area, the west country, and Scotland breed initiative in oversea enterprise, and the rest of the British Isles is comparatively lacking in it. But the definition of pioneer wants more consideration, and the number of persons selected needs to be much larger in order to give any just idea of the part played by different sections of the British Isles in the making of the Empire.

Mr. Evans Lewin, in a volume compact with information, describes the chief products of the Empire. His purpose is to show how immense are its natural resources and how desirable it is to extend inter-Imperial commerce. In a concluding chapter on manufacturing production in the dominions he argues that the present position is transitory, and that the dominions have now become active competitors in industry with the mother country, "a new phase of our Imperial development." He stresses the importance for the future of the Empire of "mutual concessions and mutual adjustment of the conflicting trade interests of its component parts."

Significant as is the growth of colonial industry, there can be no doubt that the sphere of most rapid change in matters that affect the relations of the different parts of the Empire, is its means of communication, which, together with the Press of the Empire, is the subject of Mr. J. Saxon Mills' volume. He discusses the railway, steamship, aeroplane, telegraph and cable, wireless and wireless telephony, and the All-Red system. The question of means of communication has always been one vitally affecting the development of the Empire, and it is now undergoing before our eyes an extraordinary transformation whose extent, consequences, and significance we can hardly as yet foresee. To emphasize this is the purpose of Mr. Mills' sketch of the subject.

E. A. B.

The Resources of the Empire. With a Foreword by **H.R.H. the Prince of Wales, K.G.**, and a General Introduction by **Sir Eric Geddes, G.C.B.**, 12 vols. London: Ernest Benn, Ltd. 1924. 10 × 7¼. 21*s. net each volume.*

(1) Food Supplies, Prof. J. R. Ainsworth-Davis. (2) Timber and Timber Products, S. J. Duly, M.A. (3) Textile Fibres and Yarns, J. S. M. Ward, F.S.S. (4) Fuel, Ed. G. W. Andrew, M.SC. (5) Rubber, Tea, Cacao and

Tobacco, W. A. McLaren. (6) Leather, E. C. Snow, M.A., D.SC. (7) Chemicals, A. W. Ashe and H. G. T. Boorman, A.I.C. (8) Ferrous Metals, M. S. Birkett. (8, pt. 2) Non-ferrous Metals, N. M. Penzer, M.A. (9) Oils, Fats, Waxes and Resins, E. R. Bolton, F.I.C., and, Russell G. Pelly, F.I.C. (10) Communications, W. Tetley Stephenson.

The scope of the survey undertaken in these twelve volumes is clearly one of almost impossible vastness, for they aim at providing an account, more or less complete, of all the resources of the Empire. To the initial greatness of the task is added the difficulty of so presenting the matter as to appeal—as is the avowed intention—both to the practical interests of the business man and to the Imperialist concerned with the question of the best utilization of Empire assets for Imperial ends. The sympathies of both may be the same, but their view-point is of necessity different. Further, it appears to have been laid down in the general scheme of the series that not even a superficial acquaintance with the subject on the part of the reader was to be assumed—with which stipulation, however, we may say at once some volumes do not comply. The fulfilment of the task seems impossible, yet, as the German philosopher Fechner would assert, "Nothing actual can be impossible," and the survey has been made. It forms in many respects an account of great value.

The volumes in the series follow as a rule the same plan of treatment, giving first a general account, then a detailed survey, largely statistical, of the production and consumption of the commodity concerned, each continent being taken in succession; and finally, an analysis of the prospects of extension and development. There are occasional references in the various texts to the inadequacy of the statistics available, and the difficulty of utilizing those there are on account of the method of their compilation; also in some cases to the incompleteness of the information—an inadequacy and incompleteness which, as Sir Eric Geddes points out in his Introduction, are, perhaps, the clearest justification for the series itself. But this does not explain or warrant the occurrence of undated statistics, as in vol. 1, i. p. xiv., nor the use of tables for the period 1908–1913 to illustrate present conditions (vol. 1, ii. p. 71). It is unfortunate, too, that there are so few maps or other illustrations: it is true there is a set of maps (8), not very clearly produced, in the volume on Communications, a solitary map of the cacao belt of the Gold Coast in vol. 5, and some scattered graphical illustrations; otherwise there is no attempt to map the data. This seems a serious omission. On the other hand, many of the bibliographies are excellent, and are of themselves a valuable contribution to the subjects concerned.

It is, of course, impossible to write, however shortly, of the volumes individually: each one would merit a lengthy review. All that can be done is to select from the innumerable points of interest raised.

The section on Food Supplies is divided into two parts, in separate volumes: (*a*) Crops and Fruits, and (*b*) Meat, Fish and Dairy Produce, the latter, (*b*), a vitally important but difficult problem. In both parts the general scheme is followed, a list of the commodities being given first, then a regional account of their production and consumption. The regional account is obviously the more important, since the first division resolves itself into a series of notes, often, of necessity, so abbreviated as to be of doubtful value; cf., for example, the note on "Yams" (two lines on p. 25, Pt. ii.), or the statement (p. 10, Pt. ii.) "Cattle for beef production take a leading place, while sheep for mutton are also of importance." From Pt. ii., however, one may collect full information as to any Empire product; the "collection" is necessary as the unhappy

result of the regional scheme of the work. To select one instance, the account of the Empire's wheat supply is obtained from pp. 21, 33–36, 52–53, 63–64, 67–68, 83–84, 100–102, 114, 125–126. At the present time about 40 per cent. of the imported wheat of the United Kingdom is from Empire areas (p. 34). Perhaps a more satisfying statement is that of the International Institute of Agriculture (July 1924), that whereas a comparison of the average production in 1909–1913 with that in 1920–1923 shows a world crop decrease of 8 per cent., the Empire yield increased 27 per cent., giving a total exceeding the Empire requirements in the average season by 2½ million tons.

Occasionally general statements occur which invite criticism, *e.g.* in speaking of the Union of South Africa, the statement that "There is no spot where some known fruit will not thrive" (Pt. i. p. 72). In the summary accounts the author drives home his point that the solution of our home agricultural problem is to be sought on the business side—in marketing and distribution *—and speaks very strongly for co-operation, which "has not met with the success it merits, partly owing to our inherent conservatism as to method, our lack of enthusiasm for education, and the apathy of the State" (Pt. i. p. 130). He quotes at length (pp. 85–91) from the report of the Departmental Committee on the Distribution of Agricultural Produce, January 1924. The immense amount of material brought into close compass in these volumes must prove of frequent use when dealing with any of the complex food problems of the Empire.

Vol. 2 (Timber) is in some ways the most optimistic of the several parts. "Although the position is a serious one, it is one which has been taken in time, and one that with public support for the policy adopted can ultimately be retrieved." "It is a position in respect of which the portents are favourable" (p. 180). Throughout the book constant reference is made to two outstanding features of the timber trade—the extent to which it indicates a lack of Empire co-operation, and the need for safeguarding the soft-wood supplies. The lack of inter-Empire development is evidenced in various ways, *e.g.* in the fact that Australia takes twice as much timber from the United States as from British Columbia; † that Canada sends to U.S.A. timber to the value of six to seven times her export to the United Kingdom (p. 22); or again, that in 1922 83 per cent. of the timber imports to the Empire were from non-Empire sources. This last fact arises from the concentration of the home markets on soft woods, of which Canada alone of Empire areas has any surplus for export. Hence the need for conservation of supplies, and their augmentation where possible. Thus attention is directed to British Columbia, the only country in which the peak of production of soft woods is not yet reached, and to the demand for artificial plantations. "Every country of the Empire is a potential soft-wood area." "Great Britain should be made to yield 2 million out of the 8 million loads of soft woods she imports yearly." "We have room for five times the forest area we actually possess." Thus the author re-emphasizes the case for afforestation. His volume contains incidentally many practical suggestions as to measures which would contribute to the growth of inter-Empire trade, deals with the findings of the recent Forestry Conferences,‡ and as a concise account should succeed in its aim of bringing before a wider public the results of the inquiries into our forest supplies.

* Presumably, in the reduction of distribution costs, criticized by the Linlithgow Report as "unduly large" (p. xiv.).

† To be viewed, however, in connection with the difference in general shipping conditions in the two areas.

‡ British Empire Forestry Conferences. London, 1920; Canada, 1923.

In vol. 3, Textile Fibres, matters of possibly even greater urgency are considered in the problems of the cotton and wool industries, which are to a certain extent problems of everyday knowledge. Again one is impressed with the very definite disadvantage of the regional arrangement adopted, preventing any consecutive account of a particular fibre being given: it seems that a "commodity" basis of division would have been far preferable. Familiar as we are with depressing accounts of the critical position of the cotton trade, the author apparently takes a view which is more than usually pessimistic. He emphasizes, on the one hand, the cumulative effect on the American crop of the soil exhaustion, rise in production costs, and weevil destruction. (It must be remembered, however, that the position has improved to a considerable extent since the book was written, the last American crop showing a great increase, and forming the largest for nearly a decade.) On the other side, the author shows the difficulties in augmenting the supply from Empire countries, concluding "it cannot yet be said that results have been very encouraging, although much admirable work has been done" (p. 154); and again, that the position of the crop in India, with her double problem of increasing yield and quantity, is "thoroughly unsatisfactory" (p. 75), while it "is devoutly to be hoped that a serious effort will be made to carry out the improvements which all cotton experts recognize as not only necessary but perfectly practicable" (p. 76). Yet 1923 showed a record area sown with American cotton (603,513 acres), and last season gave an increase of 81·5 per cent. on the 1915–18 average for long staple (above $\frac{7}{8}$ inch) compared with 29·4 per cent. increase for short staple (Report of Indian Trade Commissioner, June 1925), which to some extent at least represents the result of serious effort. The chapter dealing with African areas illustrates the difficulty arising from competitive crops of easier culture, and from inadequate and insufficient labour. Reference is made to the possibility of rain cotton in the Sudan, to which much attention has been drawn recently, and to the promise of the Nigerian fields, with their 50 per cent. rate of increase yearly since 1918. In South Africa, too, there has been a very rapid development: thus the production in 1920 was 2188 bales, that in 1923 5600 bales (p. 97). (The Empire Cotton Growing Corporation estimates the 1925 crop at 20,000 bales—'Twentieth An. Report Brit. Cotton Growing Assocn.'). Further, the Union contains large areas suitable for cotton cultivation by white labour, the introduction of which would solve many problems. The remarkable success of the Australian areas is associated with their white labour. Since the whole of the Australian crop comes to the United Kingdom, our figures for imported Australian cotton will measure this success. They are: 3·9 million lbs. in 1922, 11·7 million lbs. in 1923, 14·7 million lbs. in 1924. That great tracts of country here have almost ideal conditions for cotton cultivation is shown in the very high average yield of 800 lbs. an acre, to be compared with the average American yield of 350 lbs.

The position in the woollen industry is fully analysed and its strength emphasized, the Empire production being two-fifths of the total supply, and a very much greater proportion when merino wools only are considered. A point of significance is found in the increasing output from South Africa, compared with the relative decrease in Australia.

Section IV. of this volume gives a list of "Sources of Information" and a bibliography, arranged chronologically, completing what is described in the introductory review as a "most useful piece of stocktaking."

The editor of vol. 5 shows the need for a co-ordinated colonial policy (p. 22), and of increased direction by colonial governments of the native farmer·

Such direction is, he argues, especially essential in one-product areas, and with such commodities as those with which the volume deals—rubber, tea, cacao, and tobacco—with their great dependence for success or failure on external factors. The section on rubber surveys the rubber position in general, pointing out the provision against increased demand made by increased acreage and yield, the "fair expectation" being an output giving an ample margin above requirements. Thus further extension of planting is unlikely: the immediate need is for conservation of the Imperial assets rather than an extension of area. The competitive position of the British Rubber Planting industry is analysed as progressively good (p. 124), the yields of the crop better than elsewhere, and the costs of working less. In this connection a detailed account of working cost in a selected area is given. The appendices give lists of "interested firms," and a classified bibliography, while the statistical tables have been revised to 1924.

The last volume of the series discusses the shipping of the Empire, giving short accounts of the sea routes and analysis of the trade following them, and criticising the equipment of some of the greatest of our ports. Chapter 13 deals (in five pages!) with inland waterways, and there are contributed sections on air transport and overseas mails, and a chapter on wireless telegraphy. Of necessity, as the author's preface acknowledges, much of great importance has had to be omitted. The present volume, while of real general interest, cannot attempt to treat in sufficient detail the transport facilities available or required, and one would echo very strongly the suggestion that Sir F. Lewis makes in the preface, that when the series is revised two volumes may be allotted to the subject of Communications, or, in fact, amend the suggestion to "two volumes *at least*." That further, extended, issues are contemplated appears from the general introduction to the series, and inasmuch as such accounts should aid the country in the "cultivation of its inheritance" they are surely to be advocated. B. H.

REVIEWS

EUROPE

London Life in the Fourteenth Century.— Charles Pendrill. London: G. Allen & Unwin, Ltd. 1925. 8½ × 5½, pp. 277. *Illustrations.* 10*s.* 6*d. net.*

London: Yesterday, To-day and To-morrow.— Charles G. Harper. London: Cecil Palmer. 1925. 8 × 5, pp. xii. + 240. *Illustrations.* 7*s.* 6*d. net.*

MR. PENDRILL'S book is the result of wide reading among the archives of the City. In such a work it is difficult to draw the picture of ordinary folk, the people whose doings and misdoings are not recorded in Coroners' Rolls. There is also a temptation to be resisted, the temptation of selecting incidents for their picturesqueness, and so depicting the past in gay colours. The author avoids this largely by covering the citizens' activities systematically, though his chapter of sordid tragedies is not altogether unrelieved by lighter gleams. When, however, one has read his chapters and sifted his mass of facts touching upon the refuse in the streets, the filth of the Thames water often used for drinking, the unsanitary condition of the dwellings, and the swarm of mendicants, one is not likely to envy the fourteenth-century citizen his London.

Mr. Harper deals chiefly with the monuments of later generations of

Londoners. He is indefatigable in seeking out details which would otherwise escape the notice of the ordinary visitor or resident. His chapters on Regent Street and "Marble Arch to the Bank" especially should make his book a pleasant companion on many a ramble. Few will rejoice that in his town-planning scheme the Prince Regent failed to carry his point. Mr. Harper, by the way, has rather mixed up the story of the final break between that worthy and Beau Brummel.

Art Treasures in Soviet Russia.— **Sir Martin Conway, M.P.** London: Edward Arnold & Co. 1925. 9 × 5½, pp. viii. + 284. *Illustrations.* 16*s. net.*

When the author visited the Troitskaya Lavra he was urged to try a certain dish; "It is very Russian," said his host, "so you must taste it, but like everything that is very Russian it comes from abroad." If this is true of the cooking it is certainly also true of the works of art to be seen in Russia. Signs of contact with the outside world are everywhere visible, and the search for foreign influences in the products of the various inhabitants of Russia since remote antiquity might with some justification be carried back as far as the fourth millennium before Christ; the treasure of Maikop, which dates from the end of the Neolithic period, appears at first sight to show signs of Egyptian and Chaldean influence, but Sir Martin Conway has the best authorities on his side when he infers that such resemblances are accidental and arise, not from direct communication with the ancient civilizations of the East, but spontaneously and independently when the two races reach the same stage of development. Definitely foreign influence, chiefly Assyrian, begins to appear in Scythian art from the tenth century onwards; but here again the relationship of Scythian art with that of neighbouring civilizations remains obscure in spite of researches of Minns and Rostovtsev. With the arrival of the Greeks in South Russia there is an abundance of datable and placeable material; here, however, we are concerned not with native products but with objects imported direct from abroad—Ionian goldsmiths' work, for example, and Attic pottery. The same is true of the later glass from Syria and Alexandria and the Hellenistic cameos, down to the magnificent Sassanian plate at the Hermitage and the contemporary pieces of Byzantine manufacture. Apart from their intrinsic beauty the importance of these objects is geographical rather than ethnographical, in demonstrating the continuity of communication between South Russia and Europe and the near East, from the early Greek settlements in the Crimea to the time of Vladimir, the first of the Tsars, who married Anna, the daughter of the Byzantine Emperor Basil II. towards the end of the tenth century.

This event was of the utmost importance. From the moment Anna settled at Kiev with a number of Byzantine artists in her train there began what may fairly be called an idiomatic Russian art. If the forms and even the ideas were Byzantine in origin they were quickly adapted to Russian uses, and especially in architecture an organic style grew up whose vitality was proved by the ease with which it branched forth in new directions of its own. A comparison between the work done by native artists following the Byzantine tradition and by actual Greeks employed by Russian masters will serve to show how genuinely the foreign style became naturalized. On these lines Russian art advanced and then declined until the time of Peter the Great, when the now native tradition was submerged by the fashion for foreign art which accompanied the westernization of the Empire. The baroque palaces of Rastrelli and the neo-classic decorations of Charles Cameron are delightful in themselves, but they have nothing to do with Russia; it is significant that the desertion of

St. Petersburg and the reaction against all that it implied are attended by an attempt to revive in art the spirit of the mediæval tradition.

The lucid summary of Russian art in the earlier chapters, whose main points we have here attempted to indicate, is followed by an interesting account of the condition of museums and works of art in Moscow and St. Petersburg when the author visited them a year ago; it is indeed a matter for rejoicing if the innumerable priceless works of art in Russia before 1917 are not only safe but in the hands of competent and intelligent people who are cleaning, restoring, arranging, and describing their precious charges. But the picture has its less rosy side. Like all doctrinaires, the present authorities in Russia push their principles to absurd extremes. Everything belongs to the State, and the State is therefore overwhelmed with tons of silver teapots of no possible value or interest to any one except to their original owners. There could be no more convincing demonstration of the pathetic folly of absolute communism. When the author was asked what use could be made of this vast accumulation of useless objects he could only suggest that the melting-pot was their obvious destination. Perhaps he was right; he seems, however, to have deserted for once the non-committal attitude he was generally so careful to assume.

R. P. H.

ASIA

The Himalayas in Indian Art.— **E. B. Havell.** London: John Murray. 1925. 9 × 6, pp. xvi. + 94. *Illustrations.* 12*s. net.*

This interesting and suggestive little book appears most appositely at this time. Few of us perhaps recognize the intense reverence of the orthodox Hindu for "The Abode of Snow." The present writer has more than once had this impressed on him by remarks of the old-fashioned Brahmin, in whose eyes our very innocent desire to scale Mount Everest touches on the impious.

Mr. Havell deals with the Himalayas as the world pillar and the Creator's shrine. He traces the relations between its mighty peaks and the curvilinear spires of Northern Indian temples, and the symbolic value these mountains have in connection with the lotus. He illustrates the profile of the Shiva temple at Ellora compared with the outline of Kailasa—a striking resemblance even if it is fortuitous.

He then turns to the connection of Shiva and Vishnu with the Himalayas. This is surely a later phase—it illustrates the growth of sectarianism. The story of Ganga falling on to Shiva's head expresses this. The great stream of what was meant for a God-sent all-world religion is caught, on its way earthwards, by Shiva and sought to be appropriated to his cult, and directed into the channel of his faith; but it is too wide.

This book but touches on the great subject of Indian artistic symbolism, hitherto neglected owing to our official concentration on the archæological aspect—a very necessary aspect, as lovers of Indian art owe much to its results, though there is no reason why they should cold-shoulder the more æsthetic aspects. Some day this symbolism, which pervades all Indian sculpture, ornament, dress, and temple decoration, will come into its own, let us hope, though since we have lost to so great an extent our earlier sympathy for the symbolic side of our own religion we are, maybe, less ready and apt at grasping that of a foreign people. May we ask Mr. Havell to further this work?

C. E. L.

AFRICA

Plant Forms and their Evolution in South Africa.— J. W. Bews. London: Longmans, Green & Co. 1925. 9 × 5½, pp. viii. + 199. *Map. and* 31 *Figures in the Text.* 12*s.* 6*d. net.*

Prof. Bews, of the Natal University College at Pietermaritzburg, has been known for several years as one of the most energetic exponents in South Africa of the modern study of vegetation, its geographical distribution, succession, and evolution; and he certainly has, in the South African sub-continent, a most interesting and instructive field for his researches. South Africa presents a wide range of climatic conditions, from the luxuriant subtropical forests of the coast belt of Natal and Zululand, through the great veld region of grassland to the deserts and semi-deserts of Karroo and Kalahari and the extremely arid desert of the west coast, with the addition of the sharply defined "Cape region" of winter rains, with its hard-leaved shrub and tree flora of Mediterranean type. Not only so, but the evolution of the varied vegetations of the sub-continent has been uninterrupted by any recent glacial period, and has been constantly recruited by immigration from the great tropical "reservoir" of plant life to the north; furthermore, the vegetation has not yet been so modified by man as to obscure its natural responses to climatic conditions. It is therefore an exceptionally fine field for the type of study to which the author is devoted.

In the work under review Prof. Bews gives a brief *résumé* of the geographical and climatic conditions of the various regions of South Africa and of the chief types of vegetation corresponding with them. He then takes these types one by one and discusses in detail the "life-forms" of the different species of which they are made up. "Life-form," it may be explained, is a term applied by modern students of vegetation to the type of vegetative conformation and behaviour of a species, *e.g.* the tropical rain forest tree with its relatively large somewhat leathery evergreen leaves and its continuous growth, uninterrupted, or only slightly interrupted, by seasonal change, the typical deciduous tree with leaves of softer texture, displayed only during a not too dry summer, the evergreen conifer with its reduced needle-shaped or scale-like leaves, are three very distinct arboreal life-forms, and many more may be distinguished among shrubs and herbs. All these are more or less closely adapted to prevailing climatic (or other) conditions of the habitat.

The main argument of the book is directed to showing that evolutionary sequences can be traced in life-form, and therefore in types of vegetation, just as they can in floral structure. Certain habitats, *e.g.* moist tropical forest, stream banks and swamps, seashore habitats, and possibly mountain habitats, are regarded by Prof. Bews as having existed from Cretaceous times and as having remained relatively constant and uniform ever since. These contain the most primitive types of life-form as well as the most primitive species as judged by floral characters. Other types of habitat are more recent, and their life-forms and species are in general derivative. Among these are the great grassland areas, the dry scrub, semi-desert and desert areas. The great bulk of the vegetation of South Africa came from the Tropics, migrating mainly down the eastern side of the continent, and spreading from the coastal region inland along the river valleys at right angles to the coast, the various types undergoing more or less modification as they encountered drier conditions, so that a distinctive South African flora and vegetation, ultimately of tropical origin, became evolved. Sharply contrasted with this are the Cape (south-western) and temperate mountain floras, mainly of small hard-leaved shrubby

type, which had a distinct origin, the exact nature of which is still in doubt, and show many primitive features not shared by the tropical flora and vegetation coming from the north and migrating westwards.

The book is illustrated by a number of excellent pen-and-ink sketches of typical South African life-forms, by Miss Stella Gower. A. G. T.

La Découverte de l'Afrique au Moyen Âge. Cartographes et explorateurs.—Charles de la Roncière. Tome Ier, "L'Intérieur du Continent." Tome IIe, "Le Périple du Continent." Ouvrage publié sous les auspices de S.M. Fouad Ier, Roi d'Égypte. Cairo: Société Royale de Géographie d'Égypte. 1925. $14\frac{1}{2} \times 11$, pp. viii. + 175, 145. *Maps and Illustrations.*

These handsome volumes, adorned with many beautiful reproductions of mediæval maps and some excellent colour plates, are a tribute to the munificence of the King of Egypt, who gave the commission for them, and to the scholarship of their author, the erudite historian of the French Navy. The occasion of their production was the fiftieth anniversary of the foundation of the Geographical Society of Egypt, and the suggestion originally came from the late Adolphe Cattaui Bey, delegate to the centenary of the Société de Géographie de Paris in 1921. The funds for the work were specially provided by the King, and the Society was especially fortunate in persuading M. de la Roncière to undertake it, for no scholar is better fitted by experience or intellectual equipment for the task.

Few problems in the history of geographical discovery present more tantalizingly fragmentary evidence or more baffling difficulties of interpretation than does Africa before the great modern era of exploration that began in the latter half of the eighteenth century. Mediæval knowledge of the interior of the continent derived directly from the ancients, but a gap of darkness separates it from the modern world, so that the subject, while ill defined in one direction, is sharply limited in the other. Knowledge of the coast-line was almost entirely lacking in the west down to the close of the fourteenth century, but it was completely revealed within the course of the succeeding hundred years. The story of the exploration of the interior is scattered, while that of the coast is a single episode, and the method of treatment in two separate parts adopted by M. de la Roncière was therefore inevitable. But the work is disconnected even within the bounds of each section. The first volume consists of a series of essays that are almost independent of each other, and it is difficult to glean from them any connected idea of the development of geographical knowledge; the second treats of a much better-known story, and is little more than a recapitulation of the familiar incidents of oceanic discovery, with some acute and often illuminating comments. The range of original authorities consulted and of monographs whose results have been laid under contribution is as vast as we are accustomed to expect from our learned author, and British students will owe him a debt for introducing them to the work of many recent Continental writers whose articles might otherwise have easily been overlooked.

The theme of the work is concerned mainly with mediæval cartography, and it endeavours by comparison of the nomenclature of a large number of maps from the twelfth to the fifteenth century to ascertain the content of the practical knowledge of Africa possessed by the men of Christendom as distinguished from the vague legends that had come down to them from antiquity. The preface speaks of the author's aim to place mediæval cartography in the setting of its time, and thus raises hopes that here at last we may find the long-awaited story of mediæval intercourse with distant lands. It is difficult to

admit that this aim has been accomplished, and many of M. de la Roncière's readers will undeniably feel a sense of disappointment, for only here and there are momentary glimpses afforded of the ebb and flow of travel, and rarely does one get a real sense of the pulse of history.

The most important contribution of the book is an admirable series of facsimiles of portions of maps, some of which are well known, but others have not been very readily accessible. The photographic reproduction is in the main remarkably successful, and these facsimiles are much easier to consult than the plates drawn for Santarem or those in Nordenskiöld's *Periplus*. A large part of the text consists of detailed commentaries upon the maps, controlled by reference to such documents as survive and by appeal for confirmation to the work of modern travellers. Practically nothing can be adduced concerning the interior south of the equator, and by far the greatest share of space is given to the Sahara and the French Sudan. Some attention is also paid to Abyssinia and the perennial question of the kingdom of Prester John, but little fresh evidence is adduced.

Probably the most interesting part of the first volume is to be found in the chapters devoted to Saharan commerce during the centuries when it was almost monopolized by the Jews. The results of the knowledge so obtained are traced from the maps of the Jewish cartographers in Majorca, in the fourteenth and fifteenth centuries, and there is a valuable summarization of the knowledge available concerning the work of Abraham Cresques and his successors. The author holds that under borrowed names the later Majorcan cartographers were Jews who had fled during the times of persecution to the lands of the Saracens and had thus acquired knowledge of the interior of Africa that was inaccessible to Christian geographers. His detailed study of the African nomenclature of the Catalan Atlas of Cresques, of the map of Mecia de Viladestes in the Bibliothèque Nationale (1413), and of other maps of the same school is of much interest.

The relation of the commerce of the Sahara written from Touat in 1447 by Antonio Malfante, the Genoese, was first described by M. de la Roncière in his article in the *Bulletin de Géographie* in 1919 (see *Journal*, 55, 402), and he now reproduces certain pages of the MS. in facsimile and considers it in relation to other fragments concerning the African trade of the Venetians and Genoese. He attributes to the influence of Malfante's relation the journey that Benedetto Dei claims to have made in 1470 to Timbuktu, where he found that there was a considerable sale of Lombardy cloths and serges exported by the firm of Portinari.

The often-quoted evidence supporting the claim for priority of the discovery of Guinea by the men of Dieppe is once more considered, and the only possible conclusion is reached that the relation of the Norman conquest of the Canaries, 1402–5, excludes any possibility of anterior discoveries along the coast of Africa by Normans. The French voyages to the Guinea coast in 1364 are finally relegated to the domain of legend, for the whole of the nomenclature employed by the narrator of the exploits of Gadifer de la Salle is borrowed from the *Libro del Conoscimiento* of the Spanish friar.

The *résumé* of the Portuguese discoveries along the African coast is supplemented by a brief consideration of their much less studied relations with the Negro chiefs of the interior. It is to be regretted that this part of the work was not developed at greater length, for though a good deal has been done in recent years by Portuguese scholars on the colonial policy in Africa of John II. and his successors, its results are not readily accessible, and there is no con-

sidered survey of the whole field. In relation to Abyssinia, too, M. de la Roncière rather affords us a few interesting commentaries on certain mediæval maps than a satisfying correlation of the data supplied by the many monographs that he quotes. It is to be feared, on grounds such as these, that his work will be more consulted by scholars for its beautiful maps and the references in its footnotes than as a definitive history of the subject with which it deals.

A. P. N.

Wonderful Africa.— F. A. Donnithorne. London: Hutchinson & Co. 1925. 9½ × 6, pp. xi. + 302. *Illustrations.* **21s.** ***net.***

The author explains that this book was "written round" the photographs reproduced therein. It has, however, and not altogether to its advantage, expanded considerably beyond what was necessary for that purpose. The "Wonderful Africa" of the title is actually the country south of the Zambezi, through which the writer journeyed by rail, motor, and waggon. He modestly excuses himself from claiming a profound knowledge of South Africa, though he has apparently spent many years there. Nevertheless, he throws some light on recent developments: the extent of railway construction is shown by his mention of the notice-board at Bulawayo bearing the direction "This platform for the Congo." Being exceedingly optimistic of the country's future, he tends naturally to sing its praises at every opportunity, which becomes a trifle wearying to the reader. His style is also diffuse—he writes of a ship as "our great iron home," and so forth. Elsewhere he naïvely warns his readers that the Kalahari must not be confused, as it often is, with the Sahara "farther north." The photographs are good but not exceptional; the most interesting are those of the birds and penguins on Dassen and Malagas Islands, and of the ruins of Zimbabwe.

La Sahara (Collection Payot).— **E. F. Gautier.** Paris: Payot. 1923. 6 × 4, pp. 174. *Sketch-maps.* **2s. 3***d.*

The reviewer has had occasion to study much of Professor Gautier's work on the Sahara and this little volume in particular detail; he therefore finds it difficult to know where to make a beginning of writing on the subject. There is either insufficient space available to do justice to it, or else too much, for it would probably be enough to say that Professor Gautier is one of the greatest, if not the greatest, living authority on the Sahara, and therefore anything emanating from him is worth studying. The present little volume in a "home study collection" does not purport to treat the subject thoroughly or systematically. It does however convey a very good picture in which the tones vary; but it would consequently be idle to point out omissions or superficial treatment of important topics. The history of the Sahara is dismissed, and rightly so for the general reader, in one chapter of ten pages entitled "The Introduction of the Camel": that was the most important event since the first beginnings of our knowledge of North Africa west of the Nile. The reader's pleasure must not be spoilt by revealing Professor Gautier's speculations regarding the part played by the Roman Empire—the author writes so amusingly, and selects his subjects so well. If one may presume to criticize at all, it is that, in common with many French writers on North Africa, he is a little inclined to generalize about the whole Sahara in terms more strictly applicable to the centre than to the west or the east. It is perhaps inevitable, for they know so much more about the country south of Algeria than about the Libyan desert, for instance. One is a little inclined to wonder whether the eastern desert is so entirely an area of closed basins without great

watercourses (like the centre), as Professor Gautier suggests. The author does himself less than justice in the sketch-maps, which are thoroughly bad. For all its small compass the book is a valuable and interesting contribution.

F. R.

AMERICA

Down the Grand Canyon.— Lewis R. Freeman. London: Heinemann. 1924. 9 × 5½, pp. 372. *Illustrations.* 25*s. net.*

Mr. Freeman has already written the history of the exploration of the Colorado and of the struggle to control its lower course. In the former book he showed that the most effective way of doing so would be by a dam in the upper canyons. To survey the river with this purpose in view, the United States Geological Survey sent an expedition down the Glen Canyon in 1922, and another in the following year down the Grand Canyon, both of which Mr. Freeman accompanied. His narrative is concerned almost entirely with the human side, the scientific being kept in the background. More fortunate than some former expeditions, though their boats were upset several times, the party lost no lives. On the second, touch was maintained with the outer world by a wireless set. Thus there was little to disturb the good humour of the party, and Mr. Freeman writes in uncommonly high spirits throughout. There are some good illustrations.

America: the True History of its Discovery.— William G. Nash. London: Grant Richards, Ltd. 1924. 9½ × 6, pp. xvi. + 292. *Illustrated.* 12*s.* 6*d. net.*

Mr. Nash has no very new views to put forward, but, on the strength of a well-known story, desires us to believe that Columbus, when at Porto Santo, Madeira, obtained from a pilot, Alonso Sanchez of Huelva, a chart setting forth his discoveries in the Caribbean, whither he had been accidentally blown; that, armed with this chart, he was able to secure aid in Spain, particularly in Palos from the Pinzon family; and that to Martin Alonso Pinzon was due entirely the successful conduct of the first voyage. This version of events is based first upon a statement concerning Sanchez given by the Inca Garcilaso de la Vega in his 'Comentarios Reales de los Incas': and secondly upon sworn statements by Pinzon's son and other inhabitants of Palos in lawsuits between Diego Columbus, the Pinzons, and the Spanish Crown. As to the unknown pilot, Mr. Nash sets out the now very generally received view of the apocryphal nature of the Toscanelli correspondence, and argues that therefore Columbus, whom he alleges to have been an ignorant man, must have persuaded the Spanish sovereigns and the Pinzons by some such chart; but, allowing that the Toscanelli letters were forged, this does not mean that Columbus could not support his project by reasonings drawn from the common cosmographical speculations of his time. Undoubtedly the seaports of Spain and Portugal, in the years preceding the discovery, were full of seamen to whom the prospect of the finding of lands across the Atlantic must have been more than a mere possibility. The "unknown pilot" was first mentioned by Oviedo, who, however, did not accept his existence. His name was first given by De la Vega, who came to Spain in 1560, and wrote as late as 1602, but who claimed to have heard of it from the original conquistadores. It is noticeable that no mention of Sanchez was made by any of the witnesses in the lawsuits, or, indeed of an "unknown pilot," or a chart at all.

Mr. Nash does not accept the accounts of the first voyage given by Columbus, because of his general untrustworthiness, or by Las Casas or the other historians

who can be suspected of partiality. It seems at least as rash to accept those advanced years after the event by another interested party, largely at the instigation of the Spanish Government, which desired to abrogate the hereditary privileges which their Catholic Majesties had granted to Columbus.

G. R. C.

AUSTRALASIA AND PACIFIC ISLANDS

The Maori.— Elsdon Best. Wellington, N.Z.: Harry H. Tombs, Ltd. 1924. Two vols. $8\frac{1}{2} \times 5\frac{1}{2}$, pp. xv. + 528 and ix. + 637. (Vol. V. of the Memoirs of the Polynesian Society.)

Mr. Elsdon Best has long been known as a keen student of Maori life, and fortunately for ethnology his investigations began before the native culture had encountered the full corrosive force of European civilization. With a modesty which we may condone without endorsing, Mr. Best describes his book as the "jottings of a bush-collector," and there is indeed a greater freedom and freshness in his method of presentation than is usual in detailed ethnographical studies. He takes all knowledge concerning the Maori for his province, and he has steeped himself in his subject in the field, in the camp, in the study, and wherever he could find natives to give him information, or specimens to handle and describe. Perhaps his greatest affection is for cosmogony, folklore, and religion and magic, but nothing Maori is foreign to his interests.

Of the discovery of New Zealand by Polynesians some thousand years ago or more, and of the later voyages of exploration and settlement—voyages pursued in outrigger and double canoes across 2000 miles of ocean—the author writes with contagious enthusiasm, and we are led to wonder at the vitality of the stories, traditions, and genealogies which constitute the history of a scriptless people, as well as at the nautical enterprise of these ancient mariners. Whether the first Polynesian settlers found that they had been forestalled by Melanesian castaways—a view that is accepted by the author mainly on a rather insecure basis of tradition—or whether an earlier origin must be assigned to the infusion of negroid blood, is a question which has been much debated, and will perhaps never be finally settled.

Whilst the first volume of the book deals in the main with history, myth, folklore, religion, and social organization and customs, the second is devoted chiefly to material culture. Here the author's long-continued studies amongst the natives themselves enable him to place the implements and other objects in their proper setting, and to discuss the exact manner of application of tools and weapons that have long been out of use; he treats the subject from the dynamic standpoint, and he almost makes us forget that most of the objects of which he writes are now museum specimens. His knowledge of the Maori language is constantly in evidence, in the giving of native names for material objects, and in many other directions. Throughout the book the author's treatment is vivid and attractive, and although there are statements and theories which are open to challenge, it is always obvious that Mr. Best has weighed the evidence he has been at so much pains to collect.

Where so much has been given it seems ungracious to complain, but there are features of the book that call for adverse comment. The illustrations—over 220 in all, mainly from photographs—are very many of them unworthy of the beauty of the objects they represent: they are not numbered, they are not referred to in the text, and they bear no page-references. The absence of a district and tribal map of New Zealand makes itself constantly felt. There are no indicatory page-headings, and the chapters, many of them of consider-

able length and variety of subject, run from beginning to end without any kind of subdivision. Even the index has irritating features of its own, and taken as a whole the book has been produced with a certain lack of sympathy for those weaker brethren who, not having been trained in the New Zealand bush, are in some degree dependent upon signposts. Finally, the book is not priced, and it appears to be obtainable only by direct purchase from New Zealand. No one who is interested in the Maori and other Polynesians can afford to be without these volumes, but it is unfortunate that admiration for Mr. Elsdon Best's invaluable work should be tempered by exasperation at shortcomings in elementary technical points of book-production.

H. S. H.

The Kangaroo keeps on Talking.— L. St. Clare Grondona. With an Introduction by the **Right Hon. Stanley Baldwin, M.P.** London: The Victoria Publishing House. 1924. 9 × 5½, pp. 216. *Seventy Illustrations.* 3*s. net.*

This book has been written with two objects: to provide a reliable guide for intending settlers in Australia, and to bring home to the people of the United Kingdom the advantages to be gained by buying Empire products. Mr. Grondona writes with a comprehensive knowledge of his vast subject, and he has a facility for presenting facts in an interesting manner; his enthusiasm is infectious, but at the same time he is always sensible and well informed, and reinforces his arguments with figures that have been carefully verified. He gives a general account of the varied aspects of life in the All-British Continent, anticipating exactly the questions likely to arise in the minds of those in search of information, and besides dealing with everyday activities such as stock-raising, dairy-farming, and general agriculture, he has interesting chapters on the flora and fauna, irrigation, horse-breaking, mineral resources, sport, and social life. In an illuminating chapter on Cotton he points out that it is of vital interest that cotton-growing lands within the Empire should be exploited, and suggests that Australia is now the most promising field, while to stimulate the interest in foodstuffs produced within the Empire he puts forward the suggestion (warmly supported by Mr. Baldwin) that householders should combine in an association, the object of whose members would be to insist to their tradesmen that they would not buy foreign goods so long as Empire goods were obtainable at the same, or a lower, price.

The book is admirably illustrated, and as a production is wonderful value for the money. An index would have increased its usefulness, and it is curious, when so much trouble has obviously been taken to make it a comprehensive guide, that at least one good map should not have been included, while others showing the geographical distribution of Australia's various resources and agricultural activities would have been extremely helpful. O. R.

MATHEMATICAL AND PHYSICAL GEOGRAPHY

An Aid to Triangulation. The Use in Secondary Triangulation of Simple Figures having an Exterior Pole.— O. M. Miller, American Geographical Society's School of Surveying. Reprinted from the *Geographical Review*, vol. 56, No. 2, April 1925. New York: American Geographical Society.

The adjustment of secondary triangulation is easy if the figures are "simple." A simple figure is one which contains a single condition of figural closure, in other words, a single "side equation." Let ABC... NA be a closed figure, and let P be a point, named "the pole," from which rays are drawn to all the

vertices ABC... N. There must be no "cross connections," such as NB for example, if the figure is to be simple; so that to each point, except the pole itself, only three lines converge. The points A, B, C... N and P may be anywhere in the field; there are therefore quite a number of simple figures available for the surveyor: the quadrilateral, tetragon, and figures such as the triangle, pentagon, and hexagon, with interior or exterior poles, are the ordinary forms which fall within the scope of the definition.

The advantage of simple figures lies in the ease with which they may be adjusted by methods which depart very little from the rigorous: five units in the seventh place of logarithms of the distances is the ordinary limit of error. The angle equations are solved by formulæ and the side equation is then solved separately, use being made of the well-known theorem: If rays be drawn from a pole to the vertices of a closed figure, the products of the sines of the alternate angles between the rays and the sides are equal. Should the side equation upset the angle equations to an appreciable extent, the operations are repeated.

The present author (who received his training at the R.G.S. under Mr. Reeves before taking charge of the School of Surveying at the American Geographical Society) discusses a number of simple figures with an exterior pole, and gives a lucid explanation of the appropriate formulæ for the angle equations, classified according to the nature of the figures. The circumstances under which such a figure might solve an otherwise rather difficult situation receive consideration. The forms discussed by the author, added to those more commonly utilized, provide the surveyor with such a diversity of simple figures that, even if his time is limited or his knowledge of the theory of the compensation of error is circumscribed, he will find on examination that both laying out and adjustment by the old haphazard methods, never satisfactory, are no longer justifiable—are, in fact, to be condemned as unworthy of his intelligence.

The author discusses further the strength of triangulation and will be supported in his contention that the strength cannot be estimated from a single component chain of triangles, but must be considered as compounded of all the component chains into which the triangulation may be separated. The estimate of strength, moreover, should consider the adjusted chain. Accordingly the weight as computed by the author varies directly both as the total number of the unknowns and as the number of conditions and inversely as the number of independent unknowns. Some criticism may perhaps be offered on the method of compounding the weights of the component chains; but this is aside from the general value of the paper.

The pamphlet, well printed as usual by the American Society and containing excellent figures, will be regarded as a practical and useful contribution towards improvement in the methods of cadastral and secondary survey, which, so far as British colonies are concerned, are still in several instances in the rear of modern progress. G. T. McC.

HUMAN AND HISTORICAL GEOGRAPHY

Our Prehistoric Forerunners. C. E. Vulliamy. London: John Lane. 1925. 8 × 5½, pp. x. + 214. *Illustrations.* *7s. 6d. net.*

This little book is designed to explain Prehistory to people previously unacquainted with the subject. In this the author is in the main successful, though in parts a little more detailed explanation would have been an advantage. After a section on Chronology, Classification, and Stone Implements,

the mode of life and psychology of Palæolithic man, the transition to the New Stone Age, the megaliths, industry, and cult of the dead of Neolithic man are described, and, so far as the limited space permits, the exposition is up to date. A brief reference to the Bronze Age, and a few practical remarks on the study of archæology in the field, conclude the work. A Glossary and a Bibliography are appended. In his comments and criticism the author shows caution and judgment, and his work can be commended as a useful introduction to the study of Prehistory. E. A. P.

The Menace of Colour. J. W. Gregory. London: Seeley, Service & Co. 1925. 9 × 6, pp. 364. *12s. 6d. net.*

Prof. Gregory's address as President of Section E at the British Association's Meeting in Toronto, 1924, was on "Inter-racial Problems and White Colonization in the Tropics." This book is an extension of that paper, partly by the incorporation of matter then excluded for lack of space and in part by further investigation. The sub-title is a clear statement of its scope; it is "a study of the difficulties due to the association of White and Coloured races, with an account of measures proposed for their solution, and special reference to white colonization in the tropics." These difficulties are of many kinds, social, moral, economic, and political; they are usually grouped together under the title of "The Colour Question," and form one of the most serious problems of the modern world. Of all the White peoples the English-speaking group is most nearly concerned with this question, and Prof. Gregory has naturally devoted most of his book to their contacts with Coloured peoples. He gives some account of the four methods of dealing with the problem. First is that of free intermixture of the peoples: this has not been tried in any English-speaking land, but it has been practised for many generations in Latin America from Mexico to the southern tropic. The present state of these countries does not help the advocates of this solution of the problems, even though there is no proof that the relative backwardness of most of Latin America is directly due to the racially mixed character of the peoples. In the south-east of the U.S.A. the colour question has been acute since the Civil War, and it has been more fully studied and has produced a more voluminous literature here than anywhere else. The existing system is one of co-residence —there is no formal segregation of White and Coloured peoples, though they often live in different quarters of the towns and villages—together with a social, and in some states a legal, prohibition of intermarriage. Here the author's study of the question leads him to support the view that, in spite of all prohibition of intermarriage, the Negro is tending to disappear, as a Negro, by a slow absorption into the more numerous and dominant race. He discusses the various solutions which have been put forward, such as the proposals to remove all the coloured people to Africa or the West Indies; but reaches the obvious conclusion that the probable policy is one of drift, varied by occasional riots or lynchings and repressions, and that the drift will ultimately make of the American nation a people of mixed blood. A third conceivable solution of the problem is that of segregation of the subordinate people. No such segregation of the Negroes has been attempted in the U.S.A., though it has been suggested. The policy has a resemblance to that of "reserves" for natives in Canada and the U.S.A., and to the conditions of Basutoland, Swaziland, and the Transkei territories in South Africa. And it is in the Union of South Africa that segregation is now being seriously considered. The chief objections to it are economic—on the one hand the Negroes are in demand, as labourers, in the areas allotted to Whites,

and on the other they tend to outgrow the resources of their reserves, as the Basutos have done, and therefore to emigrate from them. The policy of segregation has been an effective way of dealing with a dwindling minority of aborigines among an increasing white population; it is not promising for a minority of Whites among an increasing Coloured people. The fourth policy in regard to the colour question is that of "White Australia," the complete exclusion of the Coloured peoples. Under Australian conditions it is probably the only means of avoiding the growth of a mixed population; and in the form of exclusion of undesired immigrants this policy may be very widely adopted in the near future. It is the safest policy in these matters provided that the country applying it is strong enough to uphold it. Nearly a quarter of the book, in chapters viii., ix., and vii., is given to discussion of a wide range of evidence on the possibilities of White acclimatization in tropical and equatorial lands. Prof. Gregory has brought together many conflicting testimonies; he agrees (p. 196) that the physiological evidence is rather confused and conflicting. The question is not likely to be settled by anything short of experience on a large scale, and until White colonization of hot lands has been seriously attempted it will remain open.

In his Introduction (chapter i.) Prof. Gregory states (pp. 17 and 24) that the Coloured peoples are now increasing faster than the Whites. The only reference quoted in this respect is Dr. Lothrop Stoddard's 'The Rising Tide of Colour . . .,' and the author seems unaware that these assertions are not proven. Prof. E. M. East (in 'Mankind at the Cross Roads,' London, 1924) gives reasons for disagreeing with Stoddard's statements as to the relative numbers and rates of increase of the White and Coloured races. And the reliable statistical evidence of the numbers of people in Africa is not sufficient to support the assertion (p. 24) that "the increase . . . in Africa . . . is now the fastest in the world." The reports of the Belgian Commission on labour in the Congo and of the Parliamentary East African Commission, both published since this book was written, agree that there is no evidence of such increase in the native populations. This introductory chapter is not an essential part of the book, and it is a weak part in a work which as a whole deserves the careful attention of every serious student of world relations. C. B. F.

La Vie des Animaux à la Surface des Continents.— **L. Germain.** Paris: Félix Alcan. 1924. $7\frac{1}{4} \times 4\frac{1}{2}$, pp. 260. *Two Sketch-maps.* 10 *fr. net.*

As M. Joubin points out in his short preface, this book deals with the distribution of animal-life over the land surfaces on a somewhat novel plan. In place of the usual zoogeographical regions, the author adopts what he describes as "biological domains," defined as areas of vast extent offering, if not uniformity of conditions throughout, at least such general similarity as to ensure that the animals found possess analogous adaptations. Of these domains he recognizes five: (1) the maritime, which is excluded from his survey; (2) the continental, subdivided into three main types—steppe, forest, and mountain; (3) the insular; (4) the freshwater; (5) the subterranean. The chapter dealing with the continental domain necessarily, in view of the small space available, contains little that is novel, but both the freshwater and subterranean domains are treated with a fullness unusual in elementary text-books, and in the case of the former especially there is much that is fresh and interesting both as regards facts and deductions. The chapter on the problems presented by the life of islands is also of much interest. In view of the complexity of the problems involved M. Germain has limited himself here to three areas—St.

Helena, the Hawaiian Archipelago, and the Galapagos Islands. In all three he comes to somewhat novel conclusions. He believes that the existing Hawaiian islands are the remnants of one huge island, dating possibly from the Palæozoic period, and suggests further that they, with other Polynesian islands, may afford evidence of the former existence of a Pacific continental area now sunk below the sea. The fauna of St. Helena leads him to the conclusion that the island is a remnant of Gondwanaland, and has served as an asylum for some of the invertebrates which inhabited that continental area. On the other hand, he thinks that the Galapagos islands have never formed part of a continental mass, and have received all the elements of their fauna across the ocean.

The book deals with invertebrates in greater detail than is usual in works on geographical distribution, and thus demands a considerable amount of zoological knowledge on the part of the reader. It has no index, and the table of contents gives little information, not even recording the presence of sketch-maps of the Galapagos and Hawaiian groups. These form the only illustrations, and though the first chapter gives an historical account of the growth of our knowledge of animal distribution, with some references, there is no general bibliography, and no detailed references in the later chapters.

M. I. N.

GENERAL

Under Sail: A Voyage Round Cape Horn.— **Felix Reisenberg.** With an Introduction by **David W. Bone.** London: Jonathan Cape. 1925. 8½ × 5½, pp. xxv. + 447. *12s. 6d. net.*

There seems recently to have been in America a revival of interest in the sea and its life, a revival due, apart from love of adventure and appreciation of its literature, to a realization of the importance of the ocean ways—"our last frontier." Capt. Reisenberg's book is at once an indication of that interest, and something more than a mere ephemeral production to meet the fancy of the moment. It is the straightforward account of the voyage of the wooden square-rigged *A. J. Fuller* from New York to Honolulu and back in 1897, on which the author served before the mast. Without dealing in sensational events, without magnifying the real hardships endured, he has written a book that captures the attention from first to last. The constant severities of life on a large under-manned sailing vessel, the friendships and petty bickerings in the fo'c'sle, the relaxations in port, and the lot of the sailor fallen among the land sharks of New York, are all strongly drawn. If the writer's seamanship is as thorough as his knowledge of human nature—and there are no grounds for the general reader doubting it—the book is a true and stout piece of work.

Islands, West Indian and Ægean.— **Sir Arthur E. Shipley.** London: Martin Hopkinson & Co., Ltd. 1924. 7½ × 5, pp. xii. + 139. *Illustrations.* *6s. net.*

Sir Arthur Shipley visited the West Indies on the occasion of the laying of the foundation-stone of the Imperial College of Tropical Agriculture, Trinidad. These travel sketches deal largely with the scope of such an institution, the conditions and prospects of the islands and British Guiana to-day, and suggestions for development. His description of his tour in the Ægean is rather more general, and though very pleasantly written, is rather slight.

Adventures by Sea from Art of Old Time.— Basil Lubbock. London: The Studio. 1925. 12½ × 10, pp. x. + 40. *Many plates.* £3 3*s. net.*

The Sea: its History and Romance, Vol. I.— Frank C. Bowen. London: Halton & Truscott Smith. [1925.] 11 × 9, pp. 308. *Portraits and Illustrations.* 15*s.*

Only a few years since, shipping prints and pictures were held to have scarcely more than a technical interest; now we find such things made the occasion of two almost simultaneous publications, put forth by firms that maintain high reputations for their artistic judgment. At last it seems to be realized that of all our artists some of the finest were our makers of ships.

Ships give the keynote of both these books, yet their titles are enough to show that it is not to ships as ships alone that they are devoted. Mr. Basil Lubbock follows up a former "Studio" book on "Old Naval Prints" with a selection of non-naval sea pictures that fall under his headings: "Circumnavigation, Trade and Trading Companies, Peril of the Sea, Whaling and Early Arctic Exploration, Buccaneers and Pirates, Privateers, Smugglers and Slavers, Clipper Ships." To all this store of pictorial record of sea adventure, Mr. John Masefield has prefaced three sonnets of tribute to the unknown forecastle hands who in all times have lived hard and died strange deaths to make the sea roads that run round the world—

> "Freeing this soul of man that in its cage
> Turns, and is weary of it, age by age."

Mr. Lubbock, in his Introduction, touches in turn on those things, historical, romantic, or technical, suggested by his pictures, that most interest him personally, re-telling events in his own way, and out of his own sea experience adding detail of a sort that can scarcely be communicated pictorially. He hardly does Monson justice, though, in making him say that carracks and galleons had in his time newly adopted the bowline and learnt to sail otherwise than right before the wind. His author does not here mention carracks and galleons, but refers in a general way to the ships of ancient times, while the bowline had been in use for centuries before.

The excellent reproductions, of which twenty-two are in colour, are many of them from original paintings or drawings. The Chelsea pensioner who said, "We ought to 'ave 'ad a 'Uggins," would find his favourite given place with Turner—but the print collection of Mr. A. G. H. Macpherson has been freely drawn on, and among several unusual subjects we find an early version of the favourite Japanese screen picture "The Coming of the Great Ship" (a sixteenth-century Portuguese galleon) and an amusing rendering of ships and people from Europe and America as seen by a Japanese, *c.* 1860. In a note accompanying the fine map of South America by "Arnoldus Florentius,"* a strange air-eating beast is referred to as the "Ana," whereas these are actually the final letters of "Peruviana," the "monster's" name and description being given above them.

"The Sea" is a more popular work at a lower price, yet is almost as handsomely illustrated, nine of its numerous plates being in colour. In the chapters

* The map is one of those made by the brothers Arnold and Henry Florenz van Langeren, the well-known Dutch map-makers and engravers, for Linschoten's 'Itinerario' of 1596 (in the work under review the date is given as 1599, which is that of a subsequent edition issued at the Hague). The "monster" is the harmless Ai or three-toed sloth, spoken of by Oviedo, Peter Plancius, and others as living only on air.

that accompany his pictures, Mr. Frank C. Bowen gives a summary of seafaring history that serves as a running commentary. Again the Macpherson Collection has supplied most of the subjects, many of which are contemporary, first-hand records. The difficulty of finding more authentic material has occasionally led to the use of imperfect copies of illuminations, and old-fashioned "reconstructions"; a weakness in early prints being repaired by several new colour-plates after Charles Dixon and Cecil King. Cruikshank's print is still accepted as representing the *Great Harry*, though the original is a much later ship; the seventeenth-century ships (pp. 182 and 183) might better have been replaced by the originals—the "Navire Royale" of Hondius and Dankerts' "Æmilia," after Van de Velde—of which they are coarse reversed copies, slightly altered. A photograph of the Oseberg grave-mound ship, flattened by its load of soil, is given as showing the "big beam and flat floors of merchant ships in Viking times," when, too, we are told that large northern ships had *two* rudders. The unity of the volume would probably have gained by the omission of this and the few photographs of ship models, but the decorative maps that are included are by no means incongruous, for they come near to being pictures themselves, and shade off into such birds'-eye views as old ship draughtsmen give us. In such a series one sees how ships, at first mere fillers of empty sea-space, take on importance, driving the map into corners, and learns the origin of that useful convention of the high horizon, by means of which the positions of fleets can be shown as they are in the old House of Lords tapestries, Pine's prints of which are all here, or in the Dutch print of the battle off Bantam in 1601 (not 1684), or Hollar's version of the *Mary Rose* encounter, 1670, with many others of dates later still.

The piecemeal gathering, as scattered prints, of the Macpherson collection has often made it impossibly hard to quote source and date for the illustrations in both of these volumes, many of which are from none too well-known foreign books, and one still must use some discrimination in accepting them as reliable or contemporary authority. Enough of the best, though, is given by each to make them both most welcome and valuable additions to the sea-lover's library.

R. M. N.

Sixty Years Ago: Wanderings of a Stonyhurst Boy in Many Lands.—Alexander Hill Gray. London: John Murray. 1925. 9 × 5½, pp. x. + 306. *Illustrations.* 15*s. net.*

The author of this book was born in Calcutta in 1837. Being of an adventurous disposition, he caught what Americans aptly call "the go-fever" at an early age, and has spent the greater part of a long life roaming the world. Having completed his education at Stonyhurst College, he returned to India during the Mutiny, and at twenty years of age was acting as volunteer Interpreter to the Military Train at the Relief of Cawnpore when, as the editor, Mr. George Gregory, makes clear, he would have received the Victoria Cross for his gallant conduct had he not been a civilian. Having spent several years travelling in Southern Europe, Palestine, Tibet, Persia, and Russia, he made his way to South Africa in 1868 at the time of the first diamond rush. After working for fifteen months with fair success, he finally sold for £1000 a claim that had cost him £25 and then made an expedition with his wife into British Bechuanaland. Apart from a brief description of a trip to Java, Siam, and Cochin China, the remaining chapters of the book deal with Mr. Gray's travels in Sarawak and Dutch Borneo, whither his interest in diamonds had led him. Here he was less successful in his diamond finds, but made several journeys

in what was then country almost unknown to the casual traveller. On one occasion he took part in a Dyak harvest feast, his lively description of which is the best passage in the book.

Mr. Gray's comments on the countries he visited would probably have been of more interest if published fifty years ago: to-day many of them are too fragmentary and too out of date to be of value. His use of the present tense is often confusing; when, for instance, he writes that "the hotel at Pontianak is small" one must imagine that he has been copying from his diary of 1875. Misspellings of native words are not infrequent: the Malay word *batok*, for example, does not mean "rhinoceros," but "cough." There are a number of good illustrations, whose source is not disclosed. O. R.

The Growth of Greater Britain.— **J. Fairgrieve** and **Ernest Young.** London: George Philip & Son. 1924. 7½ × 5, pp. 212. *Maps, Diagrams, and Illustrations.* 2*s.* 6*d. net.*

The authors of this little book have described and illustrated the various parts of the British Empire and have succeeded in packing a great deal of information into a very moderate compass, and at the same time in presenting it in a clear and telling manner. The many illustrations are an excellent feature of the book, and the geographical part of the narrative is good, though the historical part is generally very meagre. The book is to be recommended as a school text-book, for it is concise and interesting and contains enough and not too much matter. The title is a little misleading, as the book is a description of the British Empire with some historical information, and not a connected story of the growth of Greater Britain. E. A. B.

THE MONTHLY RECORD

THE SOCIETY

General Index to the Journal, Vols. 21 to 40.

ATTENTION is called to the leaflet inserted in the present number announcing the early publication of a General Index to the Second Twenty Volumes of the *Geographical Journal*, 1903–1912. Conditions during and since the War have greatly added to the cost of producing this index, and it is hoped that as many as possible of the Fellows, and also of Libraries possessing sets of the *Journal*, will subscribe for it, so that a fair proportion at least of the cost may be recovered. It may be pointed out that besides serving as a key to the contents of the volumes, the index may be used also as a guide to the geographical literature of the ten years dealt with, references being given, both under author's name and subject, to all the more important books and articles in serials received by the Society during that period. General works on any country will be found grouped under the name of that country, with subdivisions, when the heading is important, for the chief branches of geography (physical, political, economic, etc.) to which the individual entries apply. Towns, physical features, etc., within the country are to be looked for under their own name. Non-topographical headings (Cartography, Oceanography, Mountains, Commerce, etc.) are adopted for entries of a general character, not referring to special countries or places. These bibliographical entries are distinguished by the sign †, so that they may be sifted out at once from other references, while reviews of literature are indicated by the sign §.

To make full use of this bibliographical aid it is of course desirable to look up the actual entries in the *Journal*, but the index has a certain value by itself, as giving the names of authors who have written on any given country or subject during the period in question, with abbreviated titles of their works. Copies of the previous index (1893–1902) can still be supplied (*price* 10*s.* 6*d.*; to Fellows, 6*s.* 6*d.*).

EUROPE

Physiography of the Moray Firth Coast.

A detailed morphological study of the coastal belt of the Moray Firth has been undertaken by Mr. A. G. Ogilvie, who describes the results in the *Transactions of the Royal Society of Edinburgh* (vol. 53, pt. ii., Sessions 1922–1924). The Moray Firth is to be considered as a hollow produced mainly by differential denudation, determined in part by major fractures. The land in which the hollow lies was originally part of the north Highland peneplain, and was later tilted south-eastwards and dissected by consequent and subsequent river-valleys. Glaciation then followed, greatly modifying the minor land-forms and spreading immense quantities of detritus over the lowlands. The dissected land-margin, with its detrital fringe, was next submerged to about 80 feet below the present sea-level, and the present features, which Ogilvie describes in detail, are all closely related to the halting upheaval of the drowned margin, as evidenced by the remnants of raised beaches at 50-feet, 25-feet, and 15-feet levels. The coast west of the Great Glen is mostly high and steep, and is strongly contrasted with the low coast on the east which presents some particularly interesting features. This low coast, with the exception of a high stretch between Burghead and Branderburgh, forms the southern shore of the Moray Firth between the Ness and the Spey. The coastal belt, including most of the Lough of Moray, is a geographical unit of rich agricultural land, characterized by drumlins, kames, and osar, dried lake-beds and carses, with wide stretches of wave- and wind-built land—the shingle plains and sand-dunes. As regards the wave-built areas, the greatest amount of marine transport of materials is from east to west, because this direction is that of both the flowing tidal current and of the greatest storm-waves caused by the east and north-east gales. On the other hand, the winds which are effective in forming the dunes are not the occasional strongest but the prevailing west and south-west winds. This is an interesting fact, since the relative importance of prevailing westerly winds or occasional easterly sea-gales on the east coast of Great Britain is a complex question of exposure. The general rule seems to be that even on the east coast trees usually lean towards the east, but that where the exposure to the east is exceptionally severe (as at the mouths of the Northumberland "denes") the sea-winds prove the dominating factor. The various other parts and features of the complex coast-line of the Moray Firth cannot be discussed here; but it may be mentioned that the interior flat lands including Strathpeffer and Strath Conon, opening from the Cromarty Firth, and the Muir of Ord linking Strath Conon to the flat lands round Beauly Firth, are essentially in the coastal zone, though traces of marine submergence are not always clear. In fact, in Strathpeffer, which is a glacial trough with a flat alluviated bottom, it is doubtful whether certain terraces are of fluvial or marine origin.

Changes in Crete.

We have received from Capt. A. R. Perry Shaw an interesting account of his impressions gathered on a visit to Crete after an absence of three years

The most noticeable change is the disappearance of the fez, caused first by the transfer of the Greek Muhammadans to Asia Minor under the Greco-Turkish Convention for the exchange of populations, 1923, and secondly by its abandonment by the Jews. The presence of the exchanged Turkish Christians is not apparent, as the great majority are Greek-speakers. These immigrants are at present living temporarily, rent and tax free, on the property of the former Muhammadan population, until the extent and value of their previous holdings in Asia Minor shall have been determined by a Commission. The influx of these people has given an impetus to tobacco cultivation, the only industry able to absorb so much surplus labour. More land is being brought under cultivation, and even wheat lands and vegetable gardens are going under tobacco. The number of sheep is increasing after the decline of the war years, and the farmers in general are prospering. The merchants, however, are hit by the fluctuating exchange, and bread is dear. The motor has established itself in the island. Goods and passenger services, mainly by 1-ton trucks, run between towns and villages, and there are omnibuses in the towns. Work on the roads has been hampered by the absence of a good road-metal, only soft limestone being available. Candia and Retino are not yet connected by a good road. Electric lighting has been introduced into these two towns, and some progress has been made in general sanitation, though the building of main sewers has been held up by the financial position.

Finland.

We have received from the Finnish Consulate a pamphlet by Ragnar Numelin on 'Some Aspects of the Geography of Finland,' intended to amplify the popular, but still largely correct, idea that Finland is a country of lakes and forests. The lakes, the gift of the Ice Age, cover nearly 12 per cent. of the area, and form, with the forests and the glacial deposits and moraines, the characteristic features of the scenery. The forests themselves cover about 73 per cent. of the area. The coast-line, especially along the Gulf of Finland, is also deeply indented with bays and fiords, forming good harbours, and there are numerous groups of islands. Exclusive of Carelia, the general relief of the country is low, especially in the south and west, the area of densest population and of the chief cities, Helsingfors (Helsinki) and Åbo (Turku). Despite the nature of the country, the population of $3\frac{1}{4}$ millions is largely agricultural; except on the clay areas around the coast, the arable land has been won by the energy of the people. Recently, cattle- and dairy-farming have been greatly expanded; about 8000 tons of butter are now exported annually, most of which comes to England. Under the co-operative system, the dairy industry is capable of great development. The forests are, however, Finland's great source of wealth: immediately before the war, over 70 per cent. of her exports were timber or paper. Despite the loss of the Russian market since the war, others have been developed, and her exports considerably exceed imports. In 1924 183,000 tons of paper were exported. Her development has been greatly assisted by the natural system of water-ways; that of Saima alone, without any artificial works, is 300 kms. in length, and its importance is increased by its connection by a canal with the sea. The smaller rivers and lakes are also useful for floating timber and providing hydraulic power. The Baltic ports can be kept open by ice-breakers during the winter, and in Petsamo Finland possesses an ice-free port on the Arctic Ocean.

AFRICA

Memorial Tablet to Ferdinand de Béhagle in Bornu.

Through the courtesy of the Colonial Office we have received some details of the unveiling at Dikwa, south of Lake Chad, of a memorial tablet to the French pioneer Ferdinand de Béhagle, who was put to death at Dikwa by order of the adventurer Rabeh in the early days of French enterprise in this region. During the temporary French occupation of Dikwa (before the war the capital of German Bornu) an obelisk in memory of Béhagle was set up by his compatriots, and a tablet with suitable inscription has now been supplied by the association known as the "Souvenir Colonial Français." The obelisk has also been cased with cement by the Nigerian Government. The ceremony of unveiling was performed on 28 February 1925 by Mr. H. R. Palmer, C.M.G., C.B.E., Lieut.-Governor of the Northern Provinces of Nigeria, in the presence of Commandant Ferrand, representing the French Colonial authorities. Béhagle had reached the Shari in 1898 as the representative of a French Commercial Syndicate, but in 1899 was entrusted by the Governor of the Shari district with a mission to the north in furtherance of French interests. Having fallen into Rabeh's hands, he was executed shortly after the reverse suffered by the French force at Togbao in July 1899.

AMERICA

Topographical Mapping in Canada.

The Topographical Survey of Canada has recently forwarded to this Society copies of their new Sectional Sheets of Alberta and British Columbia, Nos. 163, Donald, and 164, Banff, on the scale of 1 inch to 3 miles (1/190,080); and a comparison of these with the old black-and-white sheets bearing the same numbers and covering the same areas shows great improvement in the topographical mapping and general style of production. The sheets have been entirely redrawn and are carefully printed in colours, with contours in brown instead of the previous rough hachuring. In the mountainous areas the contours are at an interval of 250 feet, but on the lower land on the eastern part of sheet No. 164 they are 100 feet apart. Water, water names, and glaciers are in blue, and wooded land in green. The boundaries of provinces, Indian reserves, forest reserves, Dominion parks, parishes, and settlements are shown by different colours and symbols. Railways, roads and trails are all clearly laid down, and their character carefully distinguished, while much other information is given.

The Banff sheet adjoins the Donald sheet on the east, and together they include the region for about 10 to 40 miles on either side of the Canadian Pacific Railway from Calgary across the Rocky and Selkirk Mountains to Albert Canyon and the Mount Revelstoke National Park. Both sheets are of considerable interest, but No. 163, Donald, is exceptionally so, as it includes an important tourist centre, Lake Louise, Stephen, Yoho, Field, and Glacier, being favourite starting-points from the railway for climbing expeditions. Yoho and Glacier Parks are wholly within the area of the sheet, while portions of Rocky Mountains, Kootenay, and Mount Revelstoke Parks are also shown. The surveys and investigations of members of the staff of the Topographical Survey of Canada up to the month of September 1921 and 1922 form the basis of these sheets, but in parts information from other sources has been added. The place-names are mostly clear and legible, and if, as seems to be the case, they are stamped from type, the result is much more satisfactory than usual.

North-Western Alaska.

In 1923, an area of approximately 35,000 square miles in North-Western Alaska was set apart as a Naval Petroleum Reserve. It lies, roughly, along the Arctic Ocean, north of 68° N., and west of Colville River. In 1923 and 1924 it was explored by parties of the U.S. Geological Survey, and a general account of the work and the country is given by P. S. Smith in the *Geographical Review*, April 1925. The whole area is comparatively little known, and has a scant population of about a thousand Eskimos and whites. It may be divided into three topographic units: the Brooks Range in the south, running roughly east to west with an average elevation of 6000 feet above sea-level; then a belt of gently folded plateaus, about 100 miles wide, sloping towards the ocean; and finally the coastal plain, varying in width from a few miles to 75 miles south of Barrow. The northern part of the plateau drains to the Arctic Ocean, and the rivers cross the coastal plains in steep-sided sandy channels during the dry season. Their northern parts in many cases appear to have been recently depressed, giving rise to estuaries. The region has an extremely arid climate, though this is not immediately apparent to the traveller, since summer is the wet season, with damp fogs along the coast, and the surface, owing to the frozen soil below, is swampy. The "break-up" of the streams begins about May, working progressively down the valleys. The only tree found is the willow, which grows along the valleys in the mountain and plateau sections. The remainder of the plateau is covered with a spongy mat of grasses, mosses, and low bushes. Wild sheep were seen feeding on the lichens on the mountain slopes. Caribou, in groups of two to fifteen, were common on the plateau, as also were ptarmigan. Along the coast ducks and geese were plentiful, and foxes, including the white fox, were seen. During July and August the parties were troubled greatly by mosquitoes. Of the resources of the area, Mr. Smith writes that petroleum undoubtedly occurs, but that its distribution, quantity, etc., are not yet accurately known. Several coal-beds have already been found, some of the best near the coast, and minerals may be expected on the southern edge of the mountains. There is little prospect of agricultural development, but the country is suited for reindeer.

POLAR REGIONS

Thermal Characteristics of Polar Climates.

Now that the general philosophy of polar climates is becoming better understood, a treatise by Dr. Carl Hanns Pollog entitled "Untersuchungen von jährlichen Temperaturkurven zur Characteristik und Definition der Polarklimas," demonstrating the operation of a factor apparently not hitherto generally recognized, is of particular interest (*Mitteilungen der Geographischen Gesellschaft in München*, XVII. Band, 2 Heft, 1924). The point chiefly emphasized is that, notwithstanding prevalent ideas regarding the "continental" effect of expanses of sea-ice upon the range of temperature, polar sea climates are actually much modified in comparison with polar land climates on account of the conduction of heat through sea ice to the air from the relatively warm unfrozen water beneath. The discussion is introduced with a comparison of the thermal relations in high latitudes of surfaces of bare land, water, ice, and snow, and with a demonstration of the efficacy of radiating snow and ice surfaces in bringing about anticyclonic inversions of the vertical temperature gradient, as distinct from local inversions favoured by relief. It is shown conclusively that frozen-sea climates are milder than frozen-land climates in that they show a curve of minimum annual temperature which is character-

istically flattened out in contrast with glaciated land areas which show the steep January minimum peculiar to all typical land climates. A winter with such a flattened curve, the minimum being truncated so that two or three months have approximately the same mean temperature, was called by Hann " kernlos,' and is explained by Pollog as due to the conduction of heat through the ice of seas and lakes into the air, with the consequence that such ice cannot cause the same degree of thermal continentality as snow and ice sheets on land. It will be recalled in this very connection that in the *Journal* for November 1924, Dr. Pollog exemplifies the mollifying influence of frozen Lake Baikal on the winter climate of its shores.

Dr. Pollog's principle appears to explain why it is that the area surrounding the North Pole, though intensely cold in winter and enclosed within the January isotherm of $-40°$ F. (or C.), is less cold than the mainland of North-East Siberia, much further south, where the area enclosed within the $-40°$ isotherm is much larger. The apparent difference in the mean winter temperature of the two regions would no doubt be greater than it is were it not for the difference of latitude and for the fact that air drainage from the circumpolar lowlands increases the cold of the North Pole in winter just as it reduces it in summer. The conditions of the South Polar continent show a strong contrast, since the insular setting in addition to the high altitude makes for a much more rigorous summer than in the North Polar ocean basin in its continental setting.

MATHEMATICAL AND PHYSICAL GEOGRAPHY

Deep-Sea Deposits of the Atlantic.

A monograph constituting vol. 54, part i. (1923–24) of the *Transactions of the Royal Society of Edinburgh* is devoted to the detailed description of 1426 samples of deposits from the floor of the Atlantic Ocean stored in the *Challenger* Office, Edinburgh, which had been collected during thirty-five cruising expeditions between 1857 and 1911. When Sir John Murray died in 1914 about three-fourths of the descriptive work had been completed under his supervision, and his trustees arranged for the completion of the work, embodied in this volume, by Mr. James Chumley, who further contributes a discussion of the chemical results according to the various deposit-types represented in the collection. These types, in order of abundance of samples, are Globigerina Ooze, Blue Mud, Red Clay, Volcanic Mud and Sand, Pteropod Ooze, Green Mud and Sand, Coral Mud and Sand, Diatom Ooze, Red Mud, Calcareous Sand, and Radiolarian Ooze. Of the 1426 samples, which come from both the North and South Atlantic, 772 are of Globigerina Ooze, and only 1 of Radiolarian Ooze. They all come from depths exceeding 100 fathoms, and the number of soundings is about three thousand, of which the majority were taken north of the equator. The volume is a valuable contribution to oceanography and an appropriate memorial to Sir John Murray. The material discussed therein hardly lends itself to brief synopsis, and must be studied from the original.

Meteorological Perturbations of Sea-Level and Tides.

Dr. A. T. Doodson, of the Liverpool Tidal Institute, investigates this somewhat recondite subject in *Monthly Notices of the R. A. S., Geophysical Supplement*, April 1924. The effect of the distribution of atmospheric pressure, statically and by the operation of wind, upon the level of the sea is of some practical importance, especially to harbour masters. It appears from the researches of Witting that in landlocked seas like the Baltic the wind effects are nearly twice as important as the static effect. Doodson's investigations

deal principally with the perturbations of sea-level at Liverpool and Newlyn, Cornwall, and are based upon a certain formula first used by Mr. H. L. P. Jolly, of the Ordnance Survey, in which the perturbation of sea-level is represented as a linear function of atmospheric pressure and its gradients in two directions (the pressure-gradient being used rather than the wind). The separation of the meteorological disturbances of sea-level from the ordinary tidal oscillations has been a matter of considerable difficulty in the past, the ideal method being to calculate the ordinary tidal oscillation and subtract it from the tide-gauge record. " Hourly residues " have been so obtained by the Tidal Institute for both Liverpool and Newlyn, and though the whole of the semi-durnal tidal oscillation was not removed the residue was considered to be a close approximation to the meteorological disturbance. It is found that at Newlyn the winds which cause the greatest effect on the daily mean sea-level are those which blow at right angles to the bay in which it is situated, and which act on the water within a very few miles of that place. Since, however, there was a good deal of qualitative nautical evidence that Newlyn conditions might not be at all representative of British waters, other stations were studied but not, excepting Liverpool, by the " hourly residue " method. The result is to show conclusively that purely local configuration plays a minor part. On the east coast of Great Britain the most effective winds are land winds from the west, and since west winds are also most effective on the continental shores of the North Sea, these winds raise the level of the North Sea as a whole. At Liverpool the most effective wind for raising sea-level is almost due south when operating over the Atlantic and almost due west when operating over the Irish Sea. The variations of sea-level at Liverpool are 50 per cent. greater than at Newlyn as results from a detailed mathematical analysis for the two places.

The other part of Dr. Doodson's investigation deals with the meteorological perturbation of tides. Although the correlation between the pressure of the air and any purely harmonic constituent of the tides must be zero, the equations suggest that there may be interaction between pressure disturbance and the semi-durnal, S_2, constituent of the tide. There is evidence that at Newlyn a high barometer makes high water earlier than otherwise anticipated, contrariwise at Ymuiden.

HISTORY OF GEOGRAPHY

The " Columbian " World Map.

To M. Isnard's criticism of his theory about this map (cf. *Journal*, 65, 247, 549) M. de la Roncière has now replied in the July number of the *Revue des Questions Historiques*. Certain of M. Isnard's objections are somewhat airily dismissed as without force, but all are held to be untenable and one or two to be due to positive errors on the part of his opponent. To the argument that the annotated copy of the *Imago Mundi* cannot have come into Christopher's hands till 1494 (since it belonged to Bartholomew, who had been separated from his brother for several years previous to that date) M. de la Roncière replies by quoting the opinion expressed by De Lollis that during his fight against odds in Spain the elder brother *could not* have dispensed with the very work on which his main arguments were based. The MS. reference in the book to the " present year 1491 " is held to prove that it was then in Christopher's hands. (This depends entirely, however, on the correctness of the view that the note is in Christopher's autograph, and in view of the close similarity of the writing of the two brothers this can hardly be regarded as

proved beyond all doubt.) It is still maintained that the fortified city in Spain does stand for Granada, though it is allowed that the smaller city to the south may be Almeria and not Santa Fé. Granada capitulated on 2 January 1492, so there is no reason why the map should not show it as flying the Spanish flag; in fact, Columbus expressly states that on that day he himself saw it floating over the Alhambra. As to the supposed confusion of Iceland with Frixlanda by Columbus, De Lollis is again called in to show that the confusion was due not to the navigator but to his biographers. It is held that the knowledge of Iceland displayed in the map could hardly have come from any chart-maker of Southern Europe except Columbus.

Since M. Isnard denied any cogency to the agreement between the map and the MS. notes, M. de la Roncière devotes some space to a demonstration of the exactness of that agreement, in numberless details and not merely in the copying of a single passage. The map, he says, is positively steeped in D'Ailly's work. The concentric spheres of the Universe appear in both documents, as also D'Ailly's pronouncement that even if projected on a plane surface the sphere may still be shown as circular (as it is in the smaller map on the sheet of parchment). The fact that both discuss the navigation of Solomon's fleets in similar terms becomes all the more striking through a reference made in the notes to "nostris cartis a papiri ubi est spera." In another passage Columbus refers the reader to maps made by himself when speaking of the simultaneous observation of an eclipse at Carthage and Arbela (the latter said to be near Meroe), and M. de la Roncière regards it as significant that a city with high tower is marked on the map (as *civita* only) to the west of Meroe. These are not all the agreements, and their cumulative value is certainly not to be lightly set aside. On the other hand, no very satisfactory reply is given to M. Isnard's contention that the map, even if made by Columbus, would have helped little towards convincing the sovereigns of the feasibility of his project. But as M. de la Roncière now speaks of it as merely one out of several maps made by the navigator, he is perhaps less inclined than at first to press its claim to be the very one submitted to the sovereigns.

Memorial to Captain Scott and his Companions.

After the tragic death of Captain Scott and his four companions in the Antarctic a Committee was formed at the Mansion House to arrange for the setting up of a National Memorial to the explorers (a site being provisionally chosen in London), and a design by the late Mr. A. H. Hodge was adopted. Then came the War, which delayed the execution of the project although Mr. Hodge was engaged on the sculpture at the time of his death. The work has at last been completed, and the memorial was unveiled at Devonport on August 10, that port having in the end been chosen as the most appropriate place for it, as being the birthplace of Scott as well as a station of the Royal Navy. The unveiling ceremony was performed by Commodore C. W. R. Royds, C.M.G., R.N., a member of Scott's first Antarctic Expedition, who paid a fitting tribute to the high qualities of the lost explorers, three of whom were known to himself personally. Those present included Captain Scott's widow, now Mrs. Hilton Young, with her young son, Peter Scott, and Commander Hilton Young; Mrs. Wilson, Dr. A. E. Wilson's widow; Alderman Sir David Burnett, representing the Mansion House Committee, and Rear-Admiral Skelton, who was engineer in the *Discovery* during Scott's first expedition, the last-named placing a wreath at the base of the monument on behalf of the surviving officers and men of that expedition. The monument takes the form

of a bronze group representing Courage, sustained by Patriotism, and spurning Fear, Despair, and Death, the whole supported by a granite pylon. It has been erected on Mount Wise, overlooking Plymouth Sound.

OBITUARY

Henry Edward O'Neill.

THE Society has lost an old and valued member in Mr. H. E. O'Neill, who died at Matlock on May 27 last. Mr. O'Neill took an honourable place in the list of African explorers of the last decades of the nineteenth century, by whose labours, supplementing those of the great pioneers, many of the previously missing details of African geography were filled in. His work had been concentrated on a comparatively limited area in Mozambique and adjacent regions, but it was carried out with such perseverance and thoroughness as to shed an entirely new light on the general features of the belt of country between the Rovuma and lower Zambezi and between the coast and Lake Nyasa. The value set upon it was shown by the award to O'Neill of the Patron's Medal of this Society in 1885, only five years after he had first, as Consul at Mozambique, begun the extensive series of explorations above referred to.

Born in 1848, O'Neill entered the navy in 1862, became Lieutenant in 1863, and from 1875 to 1879 served in H.M.S. *London*, then engaged in suppressing the slave trade on the East Coast of Africa. Having qualified as Interpreter in the Swahili language he was appointed British Consul at Mozambique in 1879, in succession to the lamented Consul Elton, who had died during his attempt to reach the coast across the unknown tract north of Lake Nyasa. This appointment gave O'Neill an opportunity of adding to our knowledge of East Africa, of which he was not slow to avail himself. Much even of the coast-line of Mozambique was virtually unknown, many of the minor bays and ports from which slaves were shipped being visited by natives only. O'Neill undertook its examination in native boats, in which he visited every bay, river, and creek between Mozambique and Cape Delgado. (He had previously, in 1879, carried out a survey of the Maputa river in Delgado bay, with a view to testing the capabilities of the river as a means of transporting troops into Zululand during the Zulu war; it proved however to be one of the most fever-stricken rivers of East Africa.) A result of the Mozambique surveys was to bring to light the fine harbour of Nakala, within 40 miles of the capital.

After further coasting journeys O'Neill took up the exploration of the previously unknown interior, which between 1882 and 1885 he crossed and re-crossed by a number of different routes, sending to this Society accounts of all the more important journeys, which were printed in its *Proceedings*, while other reports, sent to the Foreign Office, were issued as Blue Books, greatly surpassing the ordinary Blue Book in interest. Besides carrying out careful route-surveys, he paid much attention to the fixing of positions by astronomical observations, and the extensive series of lunars taken by him at Blantyre were of great value as supplying one of the first trustworthy longitudes in the interior of this part of Africa. After his return to England in 1885 he gave an interesting *résumé* of his work at an evening meeting of the Society, dwelling on the general character of the country and peoples visited, and in

particular the interest which would attach to an archæological investigation of South-East Africa.

Before his retirement in 1899 O'Neill had occupied the post of Consul first at Leghorn, afterwards at Rouen, making an interesting study of the fluvial traffic of the latter port and the part played by the internal waterways in the development of French trade. The results were published in a valuable report issued by the Foreign Office in 1895. In his latter years he made his home firstly at Heathfield in Sussex and afterwards at Matlock.

Dr. Charles Forbes Harford.

It is with special regret that we record the death of Dr. C. F. Harford, which occurred suddenly on July 4, since he had long been closely associated with the work of the Society, as editor of its 'Hints on Outfit' and referee on matters connected with the hygiene of Travel.

Dr. Harford was the youngest son of the late Canon Harford-Battersby of Keswick, having dropped the second half of the name in later life. Educated at Repton and Trinity, Cambridge, he chose the career of medicine, and in 1890 became Medical Missionary in Nigeria under the C.M.S., with which body he continued to maintain close relations after his return to this country in 1892. In 1893 he joined with others in the founding of Livingstone College, designed to provide intending missionaries with instruction in the rules of health and the special dangers of tropical climates; and he became its first Principal. During his tenure of the office he organized a "Livingstone Exhibition" of travellers' equipments and health requisites at the St. Martin's Town Hall, which was on view, and illustrated by lectures, in January 1900. He continued to maintain a keen interest in and sympathy with Nigeria and its peoples, and for a time he edited a serial devoted to the subject under the title *Niger and Yoruba Notes*. He was also for some years Honorary Secretary, and eventually Chairman of Executive, of the Native Races and Liquor Traffic United Committee. With a view to improving the popular knowledge of Tropical Hygiene he edited a journal bearing the title *Climate: a Quarterly Journal of Health and Travel*, of which five volumes were issued between 1899 and 1905; and as joint Secretary of the Society of Tropical Medicine and Hygiene from 1908 to 1917 he did further valuable work in the same direction. Besides the publications already mentioned he was the author of a life of 'Pilkington of Uganda,' dealing with an important episode in the history of the C.M.S. Mission in that country.

CORRESPONDENCE

The Spelling of Tibetan.

IN the very interesting review of Sir Charles Bell's 'Tibet Past and Present,' which appears in your July *Journal*, the reviewer in his last paragraph makes some rather severe strictures upon Sir Charles Bell's method of writing Tibetan words. I venture, with great diffidence, to submit some observations on your reviewer's remarks in this connection.

He will, I am sure, excuse me when I say that he is, in my opinion, guilty of some exaggeration when he says (for instance) that Tibetan is "not so very much more unphonetically written than English itself." English, it may

be admitted, is bad enough in this respect; but Tibetan is many times worse—as will be seen from your reviewer's own version of certain Tibetan words. To attempt to *transliterate* Tibetan, in fact (and this can only be done with the aid of certain more or less arbitrary diacritical marks), is to produce a repellant-looking and utterly unpronounceable collocation of letters, quite useless as a guide to the spoken words (except to Tibetan scholars, and useless even to them unless they have also studied the vernacular), which no one would dream of using for such practical purposes as a map, or a popular work on Tibet such as Sir Charles Bell's.

Your reviewer, however, says that "if we transliterate exactly, we can indicate the rules of pronunciation with little more explanation than is required for the amateur who attempts to write the language as it is spoken."

Can we indeed do so? When I was placed on special duty during the preparatory period before the Mission to Lhasa in 1904, this was one of the very first matters which attracted my attention, and I prepared a memorandum of proposed "Rules for the Phonetic Transcription into English of Tibetan words" (of which I enclose a copy). I quote the introductory paragraph:

"The Tibetan system of spelling is so peculiar and so complicated that a mere transliteration of a given word into English characters gives no idea whatever of the correct pronunciation. This fact probably accounts in a great measure for the wide divergences to be found in the spelling of place-names in existing maps of Tibet. Scarcely any two maps will be found to correspond; and in some cases the differences are so great as to render the identification of a particular place in two separate maps almost impossible. This grave inconvenience may be obviated, at any rate in maps published officially, by the adoption of a simple system of transcription, based on the recognized rules of Tibetan orthography, which will produce a word in English characters of the approximately correct sound. It is impossible to reproduce the *exact* Tibetan pronunciation in Roman characters; the Tibetan language has tones and shades of expression peculiar to itself which can be learnt only by oral instruction. It is merely misleading to attempt to reproduce them in any European system of spelling."

As you will observe, it takes six printed pages to cover every case of transcription, and to give an even approximately correct phonetic spelling for every syllable. It is, therefore, scarcely the simple matter indicated by your reviewer.

No. Emphatically Sir Charles Bell is right in making use of a simplified form of transcription in a popular work. He could no doubt have given the exact scientific transliteration in footnotes, but in a book of this nature it would have been rather pedantic to do so. I may add that he has used this simplified form of spelling also in his admirable Tibetan Grammar—a work for which all students of the spoken language owe him a debt of gratitude.

I need scarcely add that for strictly scientific works the strictly scientific method of transliteration should of course be adhered to.

W. F. O'CONNOR, Lieut.-Col.